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HISTORY OF WS 117L - ROUGH DRAFT

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CHAPTER I

Introduction

During World War II pertinent German research came to the attention of American military personnel and under the sponsorship of the Army Air Forces, the RAND Corporation* undertook feasibility studies of earth satellites. and issued [illegible] on 1 February 1947 The Air Force made a preliminary study and evaluation of ~~the~~ RAND satellite reports, ~~which were issued 1 February 1947~~ and [illegible] reported in ~~reported in~~ September 1947 that a satellite was technically feasible.[1]

In 1948 the Air Force + ~~(established 17 September 1947 in accordance with the National Security Act of 1947 approved 26 July 1947)~~ requested

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* Commanding General of the Army Air Forces, General H. H. Arnold was in early [illegible] among the first to see the need for such an organization as RAND, and was [illegible] the first to [illegible] ~~offer~~ a way to finance it. The Douglas Aircraft Company, Inc., Santa Monica, California, gave a home to the new research activity during the early years and finally, in 1948, ~~in 1948~~, with financial support from The Ford Foundation, The RAND Corporation was formed as an independent nonprofit research organization.

+ The National Security Act that established a [illegible] of the [illegible] was signed [illegible] H. S. Truman on 26 July [illegible]. The Air Force became officially [illegible] on 17 [illegible]

SMEH-100-1

RAND to establish a program for the further investigation of possible satellite development.[2] On 1 March 1954, after RAND had studied the project for several years, it issued a ~~RAND published its~~ report under the nickname "Feed Back" ~~in~~ which [illegible] "no didn't 'say'" the conclusion of which was that ~~it reported that~~ a space vehicle could be placed in an earth orbit by a rocket powered booster and that existing system component development problems would neither ~~not~~ require radically new technology nor enormous costs.

On 14 September 1954, after RAND had completed its study on Project Feed Back, Air Research and Development Command issued instruction -- Development Directive Number 1115 -- to ~~that directed~~ implement~~ation~~ and execu~~tion~~te, within certain limitations, an "Advanced Reconnaissance System", as proposed in Development Plan Number 1115, dated 30 August 1954,* ~~of Development Plan Number 1115, 30 August 1954, subject: "Advanced Reconnaissance System." Project 1115 was originally approved on 12 May 1953.~~ Air Research and Development Command (ARDC) assigned primary responsibility for implementation and execution of the development plan to Wright Air Development Center, Dayton, Ohio.[3]

Air Force personnel initiated further studies under such divergent titles as: telivision techniques, intelligence parameters, attitude and guidance control, auxiliary power plant, effects of nuclear radiation on electronic components, etc. By 1955 the Air Force had obtained sufficient data from the "in house" ARDC feasibility studies to insure that component problems were surmountable and began design studies.[5] Consequently, in that year, Wright Air Development Center awarded design study contracts to Radio Corporation of America, Glenn L. Martin Company, and Lockheed Aircraft Corporation ~~for the purpose of~~ to determine if a reconnaissance satellite system could be developed within a time span ~~which would~~ to warrant a full scale development effort.[6] ~~The~~ On 17 December 1954 the reconnaissance satellite system, designated Weapon System 117L,—a designation reserved for ~~use in~~ proposed destined ultimate system development—acquired a new nickname, "Pied Piper", ~~on 17 December 1954 for administrative purposes at the request of Major Quentin A. Riepe, who was Weapon System Officer for Wright Air Development Center Project MX-2226.~~ Major Quentin A. Riepe, Weapon System Officer for Project MX-2226, at Wright Air Development Center, wanted to use the nickname for an administrative convenience. Project 1115 ~~had~~ acquired the MX number, along with its unclassified title "Advanced Reconnaissance System", on 8 January 1954.[7]

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* Project 1115 was originally approved on 12 May 1953 [illegible] a 'go ahead' decision [illegible] [illegible] through [illegible] evaluation.

During the time the advanced reconnaissance satellite system was under study the Air Force also had under consideration a guided missile, the Atlas. Effective 8 April 1954 the Air Force established the Office of the Assistant Chief of Staff for Guided Missiles and directed ~~the~~ The ~~Assistant Chief of Staff for Guided Missiles~~ to accelerate the Atlas program under the highest Air Force priority. ~~and awarded the highest priority in the Air Force to the program.~~ The Air Force assigned ~~field responsibility for~~ the Atlas ~~program during~~ development and test program to Air Research and Development Command and directed The ~~Air Research and Development~~ Command ~~to~~ establish a field office on the West Coast with a general officer in command.8 The Air Force appointed Brigadier General Bernard A. Schriever, Assistant to the Director of Research and Development, USAF, for Project Atlas. Air Research and Development Command established the Western Development Division at Los Angeles, California, effective 1 July 1954 with ~~Bri~~ Schriever in command.9

In the fall of 1954 ~~the~~ Western Development Division, in addition to creating a management organization, and recruiting civilian and military personnel for staffing the new organization, [illegible] ~~made~~ a staff study for Lieutenant General Thomas S. Power (Commander ARDC), [illegible] ~~covering study of~~ the inter-actions of the existing Atlas program with a 1500-Mile Tactical Missile and a ~~the~~ satellite program. Wright Air Development Center was working on the latter two projects.[10]

In June 1955 the Department of Defense Satellite Committee (Mr. Donald A. Quarles, Director of Defense, had appointed the committee within DOD to study the best method of providing the United States with a satellite between the dates ~~June~~ [illegible] 1957 and December 1958. The committee was known as the "Stewart Committee", named after its Chairman, Dr. Homer J. Stewart.)* visited Western Development Division for a briefing on the Atlas Program. At the request of Headquarters Air Research and Development Command, Dr. B. D. Fried of Ramo-Wooldridge Corporation (~~contractor for~~ Western Development Division Contractor for technical direction and systems engineering) presented to the committee a technical analysis of the Atlas capabilities of placing a 500-lb or greater payload in a satellite orbit. Colonel Harold W. Norton, Assistant Deputy Commander, Technical Operations, presented the committee a ten-minute talk on the Atlas Program.[11]

Colonel Norton and Dr. Fried again ~~presented a~~ briefed ~~to~~ the Homer J. Stewart Committee on 7 July 1955. On 12 August 1955, Mr. Trevor

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*Members of the Stewart Committee, 1955 were: Dr. Homer J. Stewart (Chairman) Professor, California Institute of Technology; Dr. Richard Porter, Chairman of the Earth Satellite Panel of the U. S. National Committee for the IGY; Dr. R. McMath, Professor, Astronomy, University of Michigan, Director, McMath-Hubert Observatory; Dr. C. C. Lauritsen, Professor, California Institute of Technology; Dr. J. Kaplan, Chairman, United States Committee for the IGY, National Academy of Sciences: Dr. C. Furnas, Chancellor, University of Buffalo; Dr. J. B. Rosser, Professor, Cornell University; Mr. George Clement, RAND Corporation, Santa Monica, California; Mr. R. Buchheim, RAND Corporation, Santa Monica, California.

Gardner, Special Assistant Secretary (Research and Development) of the Air Force, and others attended a meeting at Western Development Division at which time an Air Force position was established as a result of the Stewart Committee ~~report~~. The International Geophysical Year (IGY) satellite was assigned to the Navy with the Martin Viking (a high altitude sounding rocket, not a weapon, which later became Vanguard), to be an integral part. Inasmuch as the Advanced Research satellite vehicle was also a satellite, it had become involved in top governmental discussions, ~~and~~ control in the scientific satellite program.[12]

Throughout the next few months other pertinent meetings were held with the result that "considerable heat" was generated by Air Research and Development Command, Wright Air Development Center, and Holloman Air Development Center on the subject of the IGY and the advanced reconnaissance satellite. Neither project could proceed without utilization of the Atlas missile as a booster.[13]

On 17 October 1955 Air Research and Development Command issued Systems Requirement Number 5 making Western Development Division responsible agent for Advanced Reconnaissance System (WS 117L). Effective 6 February 1956 Western Development Division

(continued on next page)

established the office of Assistant for Weapons System 117L (WDTS) and appointed Colonel Otto J. Glasser as Acting Assistant and Navy Commander Robert C. Truax* as the Acting Deputy Assistant. During the following months military satellite management functions phased from the Wright Air Development Center (ARDC), Dayton, Ohio, to the Western Development Division (ARDC).

A joint Air Research Development Command/Western Development Division/Wright Air Development Command/Air Materiel Command contractor evaluation board met 12-20 March 1956 at Wright-Patterson Air Force Base to evaluate WS 117L design studies prepared by Radio Corporation of America, Glenn L. Martin Company, and Lockheed Aircraft Corporation. The board found Lockheed as best qualified and recommended award of prime contract to Lockheed for development of WS 117L.[15] However it was 29 October 1956* before letter contract AF 04(647)-97 was finally awarded to Lockheed Aircraft Corporation for the development of WS 117L that was to provide continuous surveillance (visual, electronic and infrared) coverage of the USSR and USSR-dominated countries.

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Systems Requirement Number 5(which made Western Development Division responsible agent for WS 117L) also directed that Western Development Division, with the support of the centers, submit a systems development plan to headquarters USAF by 1 April 1956. With the combined efforts and talents of the centers, Western Development Division submitted a development plan for WS 117L on 2 April 1956.* On 22 May 1956, Commander, Air Research and Development Command notified Commander, Western Development Division, that Air Staff was reviewing the development plan but neither Air Research and Development Command nor USAF FY 1957 financial plans carried funds for WS 117L; and OSD FY 1957 emergency funds were being investigated. Authority to initiate contractual action for systems development was not granted because FY 1957 funding had not been resolved. Western Development Division was authorized to announce contract or selection and expend remaining Project 1115 funds to maintain continuity of engineering study by Lockheed.[16] Western Development Division notified the winn~~ing~~er and losing contractors on 25 May 1956, and on 12 June 1956 issued a Contract Change Notice (CCN), financed with $322,245 of Project 1115 funds to extend Lockheed's contract to 1 October.[17]

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note [illegible]

* Mgmt Report 18 [illegible] 56 sgd Col Charles H Terhune
from -- 5 Nov 56 8 - date for contract award.

The Scientific Advisory Committee on Ballistic Missiles to the Secretary of Defense held its fourth meeting 16-18 July 1956 at Western Development Division at which time the committee recommended approval of the WS 117L program. The program the makers of the development plan envisioned consisted of three operational systems with somewhat different capabilities as follows: (1) Pioneer System; (2) Advanced System; and (3) Ultimate Systems. The advanced reconnaissance system proposed development consisted of eight phases. The development plan specified a two stage vehicle composed of an ~~ICBM~~ Intercontinental Ballistic ~~M~~ Missile booster for the first stage and a vehicle complete with a propulsion system and internal controls for the second stage. The first stage of the two stage vehicle to be launched from United States' territory was for boosting the first stage for a distance of approximately 3,000 miles from the launch pad and then drop away from first stage after engine burn-out. The second stage propulsion system was for furnishing the necessary power to propel the second stage vehicle to an altitude of about 300 miles where it would assume an orbit after which internal controls would orient the vehicle into its proper attitude. ~~The Scientific~~

The Scientific Advisory Committee's approval of the WS 117L program did not include an approval of a booster for the system because of its development interference with the ICBM program and reported that it was not yet clear whether the Atlas (Strategic Missile-65) or the alternate ICBM, Titan (Strategic Missile-68)* would eventually turn out to furnish the more suitable WS 117L booster.

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* USAF (AFDDC) granted authority to ARDC on 2 May 1955 to immediately proceed with second airframe configuration development of ICBM ~~that would~~ provide for the Tactical Ballistic Meissile (TBM) (General Operating Requirement 50 TA-1c-1-59). The GOR was later (27 Sep 55) amended to specify a Medium Range Ballistic Missile Weapon System. WDD issued a letter contract AF 04(645)-56 for development of the alternate airframe on 27 Oct 1955 to Martin Aircraft Company, Denver, Colorado. On 27 November 1955 WDD issued letter contract AF 04(645)-65 to Douglas Aircraft Company, Inc, Santa Monica, California, to develop ~~the~~ Thor, an Intercontinental Range Ballistic Missile (IRBM) based on GOR 50-TA-1c-1-59, which required a missile capable of delivering a 2,500 pound warhead nose cone combination.

On 24 July 1956, Headquarters USAF approved Development Plan[18] for WS 117L dated 2 April 1956 and on 3 August 1956 issued Development Directive Number 85 for Weapon System 117L Advanced Reconnaissance System. D. D. No. 85 was applicable to General Operations Requirement Number 80 dated 15 March 1955, and assigned 1A priority (assigned when action is essential to the successful completion of combat or direct combat support operations) and I-6 precedence rating (priorities 1B, 2A, and 3A) to the system.[19]

D. D. No. 85 constituted the authority to initiate such developments that could be supported with Fiscal Year 1957 funds limited to $3.0 million. The development plan had specified $32.1 million for Fiscal Year 1957. On 28 August 1956 Western Development Division requested from Deputy Chief of Staff (Development), USAF, thru Commander, ARDC, who strongly supported the request, additional FY 1957 funds in the amount of $21.9 million: $11.4 million for guided missiles and related equipment (P-620); $8.5 million for strategic missiles (P-131): and $2.0 million for guided missile ground handling equipment (P-244).

On 11 October 1956 Commander, Air Research and Development Command sent a follow-up message to Headquarters, USAF, requesting information on the funding program as outlined in the letter of 28 August 1956 because negotiations with Lockheed as prime system contractor for WS 117L were seriously hampered by lack of definite information on the funding program for FY 57. On 22 October 1956 Headquarters, USAF replied to both the letter of 28 August 1956 and the message of 11 October 1956, stating that $3.0 million (the amount of funds formerly allocated) constituted total funds available at that time, but that the headquarters contemplated reprogramming additional $7.0 million during FY 57 from P-600 (research and development) funds. Headquarters USAF advised that development plan should be revised to reflect an annual $10.0 million rate of expenditures and that a determination should be made of extent and specific application of FY 57 and FY 58 non P-600 funds. At that time no non P-600 funds were programmed for WS 117L.[20]

LtCol Frederic C. E. Oder (who had succeeded Acting Assistant for WS 117L, Colonel Otto J. Glasser as Assistant for WS 117L on 13 August 1956) briefed Putt on 7 November 1956 on the planned program for research and development and engineering test of WS 117L for the balance of FY 1957, utilizing $10.0 million in P-600 funds. Later in the month, ~~Air Force~~ ~~Ballistic Missile~~ Western Development Division requested additional funds deemed necessary in the development of essential components of ~~[illegible]~~ WS 117L program during ~~the~~ remainder of FY 1957. ARDC strongly supported the request for funds for P-100 (aircraft and related procurement) and P-200 (procurement other than aircraft) as well as additional funds for research and development (P-600).[21] Putt responded to the request by announcing on 10 December 1956 that ~~the~~ $3.0 million originally funded for WS 117L had been increased to a total of $5.0 million. Putt also announced that it was the intention of Headquarters USAF to add another $5.0 million P-600 funds during the fiscal year.[22] On 8 January 1957 $5.0 million in P-600 funds was released.[23]

Although WDD again wrote USAF for funds on 30 January 1957 and ARDC strongly urged USAF to make every effort to obtain P-100, P-200 and P-300 funds for FY 1957 and FY 1958 as requested earlier, there were no funds available until 11 April 1957 when Office of Secretary of Air Force approved release of $3.9 million in P-100 funds [24] which made a total of $13.9 million for WS 117L in FY 1957. The P-100 funds was the amount requested in message from Commander, ~~WDD,~~ Western Development Division, on 15 March 1957, for immediate requirements to be used as follows:

10 each Bell Hustler engines	$1.5 million
AC Spark Plug (Thor) guidance platform, Type 20 Inertial Guidance Gyros, accelerometers, mechanical control, equipment and associated gyro, and accelerometer electronic components	$0.26 million
Gimbal components for Bell Engines	$0.16 million
Propellants for ground propuslion tests	$0.10 million
3 WS 117L Satellite airframes	$0.60 million
Assorted airborne communications equipment . . .	$0.30 million
Procurement of Aerobee HI Rockets, beacons, telemetry equipment, biaxial pointing controls, airborne timing equipment and power supplies for geophysical environmental test flight program	$0.80 million
7 units of battery auxiliary power units	$0.18 million
TOTAL	$3.90 million

On 1 February 1957, Headquarters USAF, in response to request from DOD, had requested WDD to furnish information, including fund breakdown regarding possible use of WS 117L for International Geophysical Year.

Western Development Division's reply was that the most logical approach to achieve such a capability was the same as represented in fund requirement letters of 21 November 1956 and 30 January 1957.[25]

In answer to Western Development Division's letter of 30 January 1957 and Air Research and Development Command's urgent request for P-100, P-200 and P-300 funds contained in first indorsement, Putt wrote Commander, Air Research and Development Command, ~~that~~ FY 1957 P-100 and P-200 funds were already programmed and that WS 117L program had to proceed with P-600 funds already available. However, Putt wrote that another review would be made in April to determine if $4.67 million in P-100 and $4.02 million in P-200 funds could be obtained for FY 1957. Putt further requested the Development Plan under revision be amended to indicate no orbital testing before January 1960. Putt also wrote that he envisioned ~~that~~ development would be along conventional lines, which dictated ~~the~~ need for ~~the~~ establishment of a Weapon System Project Office within WDD. ARDC's response was that ARDC requested Commander, WDD, initiate action to establish a Weapon System Project Office within WDD concurrently upon receipt of P-100 and P-200 funds.[26]

The Office of Assistant for Weapons System 117L that had been established on 6 February 1956* when Colonel Otto J. Glasser was assigned acting Assistant and Navy Commander Robert C. Truax was assigned acting Deputy Assistant to Deputy Commander, Technical Operations, had further enlarged by assignment of three officers (all formerly assigned to Pied Piper office at WADC) on 1 May 1956. Captain James S. Coolbaugh was assigned as Project Officer (Aerodynamics), Integration Office; Captain William O. Troetschel was assigned as Project Officer (Facilities), Facilities and Equipment Office; and First Lieutenant John C. Herther was assigned as Assistant Project Officer (GFE), Facilities and Equipment Office.[27] On 24 June 1956 Lieutenant Colonel Quenten A. Riepe (formerly Weapon System Officer for ~~Project-MS-222-~~ Pied Piper, WADC) was assigned Project Officer (Schedules) Plans and Program Office. On 2 July 1956, Major Raymond E. Zelenka was assigned Project Officer (Programs), Plans and Program Office.[28] On 13 August 1956 Lieutenant Colonel Frederic C. E. Oder, former Project Liaison Officer at ARDC, Office of Assistant to Commander, WDD, was assigned primary duty as Assistant for WS-117L, thereby relieving Colonel Glasser.[29]

* Write note

In September 1956, Colonel Oder planned ~~a~~ build-up of personnel by 1 January 1957 to include 14 additional officers making a total of 21. Further planned build-up to 1 July 1957 included 9 additional officers, making a total of 30 assigned officer personnel. However, as of July 1957 when the Offices of Assistant to ~~the~~ Deputy Commander for Technical Operations were redesignated Directorates, only three additional officers had been assigned to Directorate WS 117L making a total of 10 officers. Captain Edward J. Conway had been assigned primary duty as Project Officer (Budget), Plans and Program Office effective 21 September 1956.[30] Major Harold F. Wienberg ~~was~~ had been assigned primary duty as Project Officer (GFE) Facilities and Equipment Office effective 19 December 1956.[31] Captain David D. Bradburn was assigned Project Officer, Facilities and Equipment Section, Facilities and Test Branch effective ~~1 July~~ 20 June 1957.[32] In addition to the officers on board as of 1 July 1957 there were three civilians, one of whom was Mrs. Elizabeth M. Hawkins who had been assigned to the office when it was established in February 1956.

In addition to ~~the~~ Weapon System 117L office that had been established within ~~the~~ Air Force Ballistic Missile Division, a Weapon

System Project Office was formally established in Ballistic Missiles Office (Air Materiel Command) effective 1 July 1957 with Lieutenant Colonel James S. Seay assigned as chief of the branch, making a formal joint ARDC/AMC Weapon System Project Office for administration of the WS 117L program.[33]

Whereas WS 117L program progress was by way of DOD's extremely conservative approach with a target date no earlier than 1 January 1960[34] for the initial orbital test, the ICBM and IRBM programs, although cut short by economy cutbacks for Fiscal Year 1957, had made appreciably more rapid progress. The Atlas ICBM program, with the highest national priority, ~~and~~ it reached flight test launch stage as Air Force Ballistic Missile Division (having been designated on 1 June 1957 from Western Development division)[35] had launched the first Atlas on 11 June 1957 from Cape Canaveral. However, the flight test launch was a failure because after the missile wobbled due to a motor malfunction, it was destroyed after 25 seconds of flight. The second Atlas flight missile that was already scheduled to be erected about the middle of July was launched on 25 September 1957 but it was also destroyed. The alternate ICBM Titan was not flight tested until 6 February 1959.

The Thor program had advanced avanced quite rapidly as on 3 October 1957 Air Force Ballistic Missile Division had launched the sixth Thor IRBM missile from Cape Canaveral. Air Force Ballistic Missile Division had launched the first Thor on 25 January 1957 from Cape Canaveral just 13 months after the contract date. Only the fifth launch on 20 September 1957 was a successful launch.

By October 1957, although little progress had been made with its limited funds, Program WS 117L had to its advantage the contractor team that had been assembled as well as the management offices, Directorate of WS 117L in Air Force Ballistic Missile Division (ARDC) and the Weapon System Project Office in Ballistic Missiles Office (AMC).

Organizationally, as a whole, Air Force Ballistic Missile Division and Ballistic Missiles Office personnel consisted of "hand-picked" military personnel and civilian employees of unusual dedication. Major General Bernard A. Schriever commanded AFBMD and as Assistant to Commander, Air Research and Development Command had directive and authority of Air Research and Development Centers. Schriever also, through Brigadier General Ben I. Funk, Commander, Ballistic Missiles Office, was able to control at one location the logistic, contracting, procurement, and other responsibilities normally exercised through Headquarters, Air Materiel

Command at Dayton, Ohio.

The 1st Missile Division that was stationed at Cooke Air Force Base and later transferred effective 1 January 1958 to Strategic Air Command with Major General David Wade in command, had been organized and staffed by Air Force Ballistic Missile Division. The members of the 1st Missile Division had been planning operational requirements concurrently with research and development.

As a member of the management structure for Air Force Ballistic Missile and Space Programs, the Guided Missile Research Division* of the Ramo-Wooldridge Corporation, the contractor for technical direction and system engineering for Air Force Ballistic Missile Division, was a scientific group whose educational achievements consisted of approximately 18% doctorate, 40% master and 39% baccalaureate degrees.

The wide geographic dispersed industrial team whose manpower numbered approximately 41 thousand employees was composed of contractors that had been selected by a selective competition process. Altogether ~~Although~~ Air Force

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* Through reorganization the Guided Missile Research Division became a subsidiary corporation on 22 November 1957, and renamed Space Technology Laboratories.

Ballistic Missile Division administered 21 Major contracts and over 200 subcontracts indirectly.

Ramo-Wooldridge was not the only scientific group whose services were available. The Scientific Advisory Committee* ~~The Millikan Committee*~~ was a group of the nation's top scientists who acted both as a scientific advisory group to the Air Force and to the Department of Defense.[36]

Time lost in research and development of WS 117L Program because of lack of national interest and mounting fund deficiencies was time lost that could hardly be regained but Air Force Ballistic Missile Division with its ~~management~~ structure ~~and~~ (see figure 1) and contractor teams ~~already~~ in operation was somewhat prepared for program acceleration when Soviet Sputnik I was launched on 4 October 1957. The

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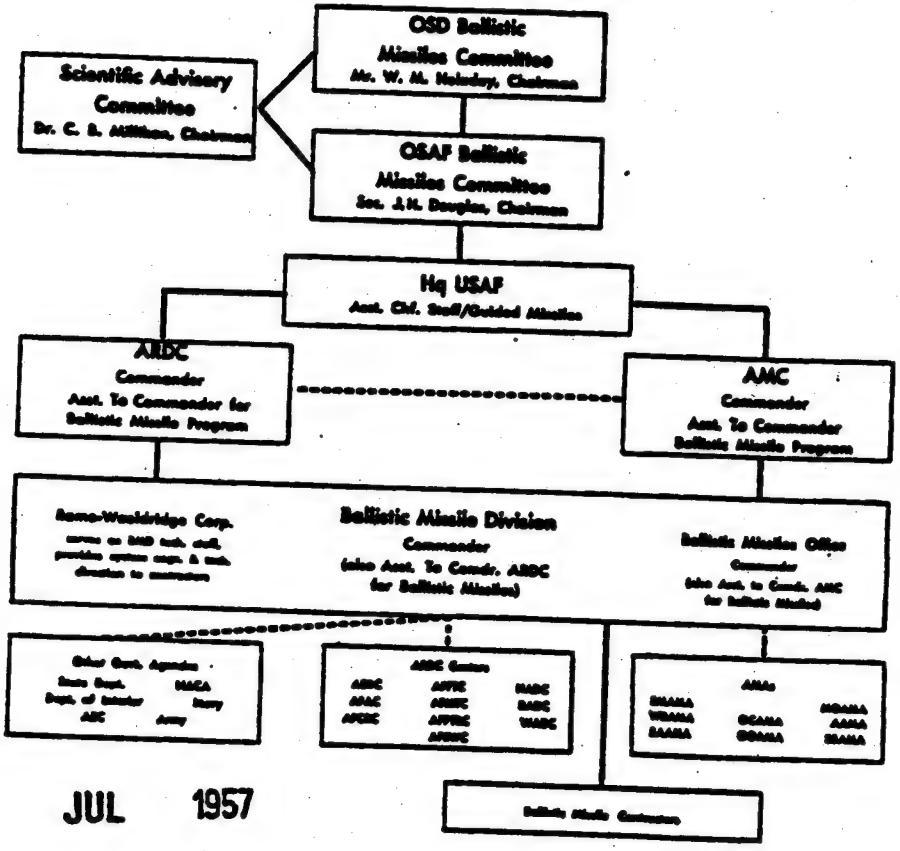
* Dr. Clark B. Millikin, California Institute of Technology was chairman ~~of Scientific Advisory Committee.~~ Prior to 1 April 1957, Dr. John von Neumann, Commissioner, Atomic Energy Commission, was chairman. Other members ~~a Scientific Advisory Committee~~ were

~~Dr. Clark B. Millikan (Chairman), California Institute of Technology~~
Dr. Hendrik W. Bode, Bell Telephone Laboratories, Inc.
Dr. Hugh Dryden, National Advisory Committee for Aeronautics
Dean John Dunning, Columbia University
Dr. Darol K. Froman, Los Alamos Scientific Laboratory
Mr. William B. Graham, RAND Corp.
Dr. George B. Kistiakowsky, Harvard University
Dr. Charles C. Lauritsen, California Institute of Technology
Brig. Gen. Charles A. Lindbergh, Darien, Conn.
Dr. Robert R. McMath, University of Michigan
Dr. James W. McRae, Sandia Corp.
Dr. J. Barkley Rosser, Cornell University
Prof. Jerome B. Wiesner, Massachusetts Institute of Technology
Dr. Herbert F. York, University of California
Mr. Carroll L. Zimmerman, Offutt Air Force Base, Nebr.
Dr. L. A. Hyland, Hughes Aircraft
Mr. James O. Spriggs (executive secretary), OSD

Figure 4

Management Structure
AF Ballistic Missile Program


OSD Ballistic Missiles Committee
Mr. W. M. Holaday, Chairman
Scientific Advisory Committee
Dr. C. B. Millikan, Chairman
OSAF Ballistic Missiles Committee
Sec. J.H. Douglas, Chairman
Hq USAF
Asst. Chf. Staff/Guided Missiles
ARDC
Commander
Asst. To Commander for Ballistic Missile Program
AMC
Commander
Asst. To Commander Ballistic Missile Program
Ramo-Wooldridge Corp.
serves as BMD tech. staff, provides system engr. & tech. direction to contractors
Ballistic Missile Division
Commander
(also Asst. To Comdr. ARDC for Ballistic Missiles)
Ballistic Missiles Office
Commander
(also Asst. to Comdr. AMC for Ballistic Missiles)
Other Govt. Agencies
State Dept.
NACA
Dept. of Interior
Navy
AEC
Army
ARDC Centers
AEDC
[illegible]
AFCRC
AFFTC
AFMTC
[illegible]
[illegible]
RADC
[illegible]
WADC
AMAs
SMAMA
WRAMA
SAAMA
OCAMA
OOAMA
MOAMA
AAMA
SBAMA
Ballistic Missile Contractors

JUL 1957

180 pound Soviet Satellite, whirling around the earth in an orbit of 560 miles apogee and 145 miles perigee at 18,000 miles each hour caused nation-wide alarm.

Although newspapers had been filled with columns about satellites and guided missiles, people knew little about what they were or what they meant to the national defense. Within hours after Sputnik I was launched, Congress began to assemble information for use in a full, complete and exhaustive inquiry into the state of defenses and the steps that would have to be taken to meet the challenge imposed by Russia's competence in rocket technology and her threat to United States national security.

Acceleration

On 16 July 1957, Air Force Ballistic Maissile Division ~~(having been redesignated on 1 June 1957 from Western Development Division)~~ submitted its second WS 117L (new nickname "New Horizon" had been assigned x on 10 July 1957) development plan* for the year. xx The plan specified that if the current level of funding continued, September 1958 would be a realistic target date for the first launch. However, a more desirable level of funding--$47.0 million for FY 1958 and $142.5 million for FY 1959--would enable a first launch in March 1959. The Air Force Council** recommended the "desirable level" of funds but before the Department of Defense gave its approval the Soviet Union launched Sputnik I on 4 October 1957 which caused widespread alarm and concern over the security of the United States and/the country's loss of ~~the country's~~ prestige. The President, Congress and Secretary of Defense began to study and debate the status of existing space-related activities, long-range space programs and whether the space program should be civilian or military.

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* Development Plan dated 16 July 1957 is no longer available at SSD. The plan was inadvertently destroyed in the program office.

** "Probably the most important development affecting policy-making in the headquarters ~~USAF~~ was the establishment of the Air Force Council in 1951. Composed of the Vice Chief of Staff, the five deputy chiefs of staff, and the Inspector General, the council had responsibility for drawing up Air Force policies and objectives, reviewing and approving programs, and giving guidance to the Air Staff. The council relieved the Chief of Staff of much of the detailed work of policy-making, presenting to him for approval only formal recommendations. This permitted the Chief of Staff to devote more of his time to interservice and international problems." A History of the United States Air Force 1907-1957 by Alfred Goldberg (Editor) p 110

x Ruckfeiler, Short Historical Explanation & Chronology WS 117L Discoverer and Midas 1956-1959
xx Mgmt Report 6 Jun 58

A few days after Sputnik I was launched, Secretary of the Air Force James H. Douglas approved the program as recommended by the Air Council as a planning objective subject to a later review with the understanding deputy secretary of defense, Mr. Quarles, and perhaps the President would have an opportunity to review the plan.[37]

On 11 October 1957, $35.1 million P-100 funds were established and transferred to Commander, Air Materiel Command. No. P-200 funds were available but early release of funds was anticipated.[38] However by 18 October the funds were limited to $15.5 million through January 1958, although planned rate of effort through January 1958 was not limited.[39]

In May 1957,[40] Lieutenant General Putt had requested the Scientific Advisory Board establish a special study group to review studies underway by Ramo-Wooldridge Corporation, in conjunction with Western Development

Division and Headquarters USAF, as well as studies in progress at the RAND Corporation and problems under consideration by industry groups. The Scientific Advisory Board ad hoc Committee on Advanced Weapons Technology and Environment* had met at RAND Corporation on 29-31 July 1957 at which time the ~~committee was briefed by~~ the Air Force and industry representatives briefed the committee members. On 9 October 1957, the Committee published its report which covered a range from specific military weapons systems to scientific experiments. The committee reported that "Military satellites for reconnaissance and intelligence missions appears to deserve the next priority amongst military weapons systems in the cis-lunar region."[41]

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* Members were Dr. H. Guyford Stever, Chairman; Professor Joseph Kaplan; Dr. Clark B. Millikan; Dr. Mark M. Mills; Professor W. H. Radford; Dr. Simon Ramo; Dr. Clayton S. White and Mr. Chester N. Hasert, Secretary.

Although orbiting Sputnik I had brought on more national appreciation and consideration of use of space for national defense, Deputy Secretary of Defense Mr. Donald A. Quarles still seemed rather cold on the planned program for WS 117L when General Putt briefed him on 16 October 1957. At the meeting were other high level officials including Secretary of the Air Force Mr. James H. Douglas and Assistant Secretary of Defense (R&D) General Curtis LeMay. After the meeting Generals Putt and LeMay met with Mr. Douglas who expressed the desire "that the Air Force look into all possible schemes that we might permit the Air Force to do something spectacular in the satellite field."[42] The next day, General Putt directed Commander, ARDC to call upon industry to consider ways to counteract world reactions to Sputnik I. As a result, the committee composed of members of AF Scientific Advisory Board, the aircraft industry and ARDC personnel met 21 and 22 October under the chairmanship of Dr. Edward Teller.*

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* Other members were: (~~See~~ Copy attached list)

[illegible]	Scientific Advisory Board
Dr. E.J. Barlow	RAND
Mr. J. Beerer	North American Aviation
Mr. K.J. Bossart	Convair
Mr. G.H. Clement	RAND
Dr. E.B. Doll	Ramo-Wooldridge Corp
Dr. W.R. Dornberger	Bell Aircraft Corp
Dr. K. Ebricke	Convair
Dr. C. Faulders	North American Aviation
Mr. C.L. Forrest	Bell Aircraft Corp
Dr. D.T. Griggs	Scientific Advisory Board
Mr. M.D. Hunter	Douglas Aircraft Company
Dr. J. Isenberger	Bell Aircraft Corp
Mr. T.G. Lauphier, Jr.	Convair
Mr. F. O'Green	Lockheed Aircraft Corp
Mr. W.F. Parker	North American Aviation
Dr. L.D. Ridenour	Lockheed Aircraft Corp
Mr. R.J. Sandstrom	Bell Aircraft Corp
Mr. M Sherman	North American Aviation
Mr. W.M Sith	Bell Aircraft Company
Mr. E Spraitz	Douglas Aircraft Corp
Dr. E.A Steinhoff	Aerophysics
Mr. G.S. Trimble, Jr.	Glenn L. Martin Co.

[redacted]

Dr. G.E. Valley	Chief Scientist, USAF
Dr. T.F. Walkowicz	L.S. Rockefeller Staff
Mr. R.H. Widmer	Convair
Mr. R.G. Wilson	North American Aviation

[redacted] [redacted]

Sub-committee number two of the "Teller" ad Hoc Committee

~~The Teller Committee~~ recommended (1) consolidation of organizations from Secretary of Defense on down, including efforts of all services and (2) "Put the ballistic missile and space flight programs on a maximum effort basis in all its aspects, without reservation as to time, dollars, or people used. Most important of all, provide a realistic assurance that the entire program has the priority of governmental and national interest required by the threat."

~~On 11 December 1957~~, After the Teller Committee published its report ~~was published~~ on 29 October 1957, the Secretary of Defense published a draft directive establishing the Department of Defense Advanced Research Project Agency (ARPA) that would manage certain advanced research and development projects. The DOD ~~draft was~~ revised the draft on 29 November 1957 and later published ~~as~~ DOD Directive No. 5105.15 dated 7 February 1958.

on 18 Oct 57, just two ~~[illegible]~~ days after General Putt had briefed Quarles, the "Stewart Committee" met at RAND Corporation at which time the complexity of the WS 117L program was discussed. Although none of the members of the committee could tell in any way, shape or fashion just how to go about reducing the complexity of the development of WS 117L and still meet the provisions of General Operating Requirement No. 80 under which the program office had to operate.[43]

At the time the design contractors made their studies, the Missile Systems Division, Lockheed Aircraft Corporation, Sunnyvale, California, and its subcontractors, Columbia Broadcasting System Laboratories and Eastman Kodak Company, prepared a Development Plan, Volume I of which was a system plan but Volume II was prepared in twelve volumes, one volume for each subsystem. The subsystems, all technically different which required many subcontractors, were as follows:

A. Airframe
B. Propulsion
C. Auxiliary Power
D. Guidance and Control
E. Visual Reconnaissance
F. Electronic Reconnaissance
G. Infrared Reconnaissance
H. Vehicle Electronics
I. Airborne Test Systems
J. Vehicle Intercept and Control Ground Station
K. Ground Data Processing
L. Vehicle Ground Support

The 2 April 1957 AFBMD development plan system description included the following subsystems:

A. ~~Airframe~~ Vehicle (Project #1755)
B. Propulsion (Project #1756)
C. Auxiliary Power (Project #1757)
D. Guidance and Control (Project #1758)
E. Visual Reconnaissance (Project #1759)
F. Electronic Reconnaissance (Project #1760)
G. Infrared Reconnaissance (Project #1761)
H. Ground-Space Communications (Project #1762, Formerly H & J ~~combined~~.)
I. Data Processing (Project #1763)
J. Geophysical Environment Data (Project #1764)
K. Personnel Operations (Project #8728)

In addition to discussing the complexity of the program, the Stewart Committee considered the IRBM (Thor) and how it could be put to use in military and/or scientific satellite program.[44] Use of the Thor was again considered when the ~~Armed=Forces=Policy=Council~~ Air Force briefed the Armed Forces Policy Council[*] on 5 November 1957.

add memo 9 Nov 57

Following the USAF briefing of the Armed Forces Policy Council, Assistant Secretary of the Air Force, Richard E. Horner notified secretary of defense that WS 117L could be accelerated by using as the basic booster,

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[*] carry next page

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Add

In addition to discussing the complexity of the program, the Stewart Committee considered the IRBM (THOR) and how it could be put to use in military and/or scientific satellite program.[44] How Thor could be used was settled on 5 November 1957 at an Armed Forces Policy Council Meeting.

On 2 November, Headquarters, USAF, requested AFBMD's assistance in preparing a presentation to the Armed Forces Policy Council* on USAF capabilities and plans for space flight testing. On 3 November representatives from AFBMD, Ramo-Wooldridge Corporation, and Douglas Aircraft Company, Inc., met to "prepare a joint AFBMD/RW/DAC position on the capabilities of THOR for this mission." The group reviewed the findings of the "Barlow" Sub-Committee (Report of Sub-committee Number Four) of the "Teller" Ad Hoc Committee and agreed "to the proposal made by DAC /Douglas Aircraft Company/ that the use of the Vanguard third stage plus THOR could realize the earliest practical capability for a large satellite or for a moon rocket."x [45]

* change to note DD Directive 5-105.3 2 Jan 57

On 4 November, Lieutenant Colonel Sidney Greene of the AFBMD WS-315A (THOR) Program Office, assisted, at the Pentagon, in preparation

* see p 32a

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[45] MFR, LtCol Sidney Greene, WS-315A Missiles Development Division, AFBMD (WDTIS) 8 Nov 57.

REPRINT
(with changes of Feb 8, 61)

January 2, 1959
NUMBER 5105.3

Department of Defense Directive

SUBJECT The Armed Forces Policy Council

Reference: (a) DoD Directive 5105.3, subject as above, dated May 13, 1952 (cancelled herein)

I. PURPOSE

To revise reference directive which established the membership, functions and administrative support of the Armed Forces Policy Council.

II. CANCELLATION

Reference (a) is hereby superseded and cancelled.

III. MEMBERSHIP

The Armed Forces Policy Council, established pursuant to Title 10, USC, 171(a) as amended, shall be composed of the Secretary of Defense as Chairman; the Deputy Secretary of Defense; the Secretary of the Army; the Secretary of the Navy; the Secretary of the Air Force; the Director of Defense Research and Engineering; the Chairman of the Joint Chiefs of Staff; the Chief of Staff, United States Army; the Chief of Naval Operations; and the Chief of Staff, United States Air Force. In addition, the Commandant of the Marine Corps shall regularly attend meetings of the Armed Forces Policy Council. Such other officials of the Department of Defense and other departments and agencies in the Executive Branch as may be designated by the Secretary of Defense shall be invited to attend appropriate meetings of the Armed Forces Policy Council.

IV. FUNCTIONS

The Armed Forces Policy Council shall advise the Secretary of Defense on matters of broad policy relating to the Armed Forces and shall consider and report on such other matters as the Secretary of Defense may direct. The members of the Armed Forces Policy Council shall report regularly to the Armed Forces Policy Council on important matters of interest to the Department of Defense.

V. ADMINISTRATION

A. The Armed Forces Policy Council shall meet upon call of the Secretary of Defense or upon approval by the Secretary of Defense of a request by any individual member to hold a meeting of the AFPC. *

B. Formal agenda will normally be circulated prior to meetings, and following each meeting Advices of Action will be disseminated as appropriate. *

C. The Office of the Secretary of Defense will provide the Secretary to the Armed Forces Policy Council and will arrange for such other staff assistance as is determined to be required. Each member will designate a representative or representatives to assist the Secretary.

D. The Secretary to the Armed Forces Policy Council shall be responsible for:

1. Assembly and preparation of material on matters under consideration;

2. Preparation and distribution of formal agenda;

3. Dissemination of Advices of Action and authoritative statements of decisions reached by the Secretary of Defense after receiving the advice of the Council;

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* Revised February 8, 1961

4. Appropriate follow-through action to assure that decisions reached by the Secretary of Defense are properly implemented, including preparation of directives where necessary;

5. Preparation of informal minutes of each meeting of the Council, to be retained in the office of the Secretary of the Council; and

6. Maintaining and safeguarding appropriate records.

VI. EFFECTIVE DATE

This Directive is effective immediately.

Deputy Secretary of Defense

use f/note instead supply directive no DoD 5105.3 - Jan 59

~~Armed Forces Policy Council~~

The Armed Forces Policy Council advises the Secretary of Defense on matters of broad policy relating to the armed forces and considers and reports on such other matters as the Secretary of Defense may direct. The Council is composed of the Secretary of Defense, as chairman; the Deputy Secretary of Defense; the Secretary of the Army; the Secretary of the Navy; the Secretary of the Air Force; the Director of Defense Research and Engineering; the Chairman of the Joint Chiefs of Staff; the Chief of Staff, United States Army; the Chief of Naval Operations; and the Chief of Staff, United States Air Force. In addition, the Commandant of the Marine Corps regularly attends meetings of the Armed Forces Policy Council. Such other officials of the Department of Defense and other departments and agencies in the executive branch as may be designated by the Secretary of Defense are invited to attend appropriate meetings of the Council.

of the Air Force presentation to the Armed Forces Policy Council. Colonel Greene ~~suggested~~ proposed use of Thor ~~vehicles~~ missiles Numbers 114, 116, and 118 could be made available in a relatively short period of time with minimum interference to the IRBM program. Major General John S. Mills, Assistant Chief of Staff for Development, Research and Development, USAF, made the Air Force presentation to the Armed Forces Policy Council on 5 November 1957.[46]

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[46] Ibid.

Following the Air Force briefing to the Armed Forces Policy Council, Assistant Secretary of the Air Force Richard E. Horner notified Secretary of Defense that WS 117L could be accelerated by using Thor to provide an orbiting satellite by March 1958. One provision was that other existing hardware would be made available. Horner proposed the three missiles/could provide one orbiting satellite by March 1958 and missiles Numbers 116 and 118 could be used for either a satellite or a recoverable animal satellite prior to 1 July 1958.

~~the Thor, providing other existing hardware would be made available,~~ ~~which could provide an orbiting satellite by March 1958. Three Thor~~ ~~missiles (Numbers 114, 116 and 118)~~ could be made available in a ~~relatively short period of time with minimum interference to the IRBM~~ ~~program, which could provide an orbiting satellite by March 1958. Horner~~ ~~proposed that Thor missiles~~ numbers ~~116~~ and 118 could be used for either ~~a satellite or a recoverable animal satellite prior to 1 July~~ 1958.

In addition to the three Thor missiles, Horner proposed that six Thor boosters could be made available from the planned production schedule as backups to insure success. The cost of the program was estimated to be $12.0 million but an immediate go-ahead approval was essential in order to provide an orbiting satellite by March 1958, or a recoverable animal satellite prior to 1 July 1958. Horner proposed use of Thor as a first stage, the Lockheed re-entry vehicle as a second stage and two Recruit Motors as a third stage that could provide a payload of 300 pounds on a 150 mile orbit and be capable of photographing over a million square miles in two days operation. The Air Force Advanced

Reconnaissance System (WS 117L) plans required use of the Atlas booster would interfere with the ICBM program or WS 117L unless production rates of the booster could be increased.#47

On 7 November 1957, Headquarters USAF notified Commander ARDC about the suggested use of the three Thor missiles (Numbers 114, 116 and 118) and requested ARDC initiate an engineering study which "will provide sufficient information to this headquarters within the next 30-45 days on which a decision can be based as to the feasibility, capability and cost of such a program." Headquarters USAF authorized ARDC to commit and obligate $100,000. made available from Headquarters USAF unprogrammed sources for a Ballistic Rocket Research Vehicle (A-621-609A).* ARDC in turn authorized Commander, AFBMD, to commit and obligate $100,000. for preliminary design studies on the project. Headquarters USAF wanted to tie the program to a specific major weapon system, but Department of Defense did not immediately give Headquarters USAF approval to proceed with the system, because it was not connected with a specific weapon system.#48

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* Program 609A was also known as Ballistic Research and Test System (BRATS) ~~which-later-became~~ and later became "Blue Scout." in September 1960

In the meantime Mr. Neil H. McElroy (as President Eisenhower had announced on 7 August 1957) had succeeded Charles E. Wilson whose scheduled resignation had occured on 9 October. McElroy reversed the DOD austerity program for on 1 November 1957 he authorized acceleration of WS 117L program at the maximum rate consistent with good management.~~[47]~~[49]

Three days later, on 3 November 1957, the Soviets launched its 1,120 pound Sputnik II, sending it and its passenger (a dog) into an orbit around the earth with an apogee of 1,168 miles and a perigee of 150 miles.

On 5 November the P-100 funds in amount of $15.9 million that had been frozen on 18 October were released.[50] Lockheed having been delayed in development of WS 117L because of lack of funds also wanted to use an IRBM missile as a booster. In the course of negotiations for the definitive contract on 12 to 17 November 1957, AFBMD personnel requested Lockheed to consider modifications of the WS 117L for a potential acceleration. Lockheed considered the inclusion of two alternate approaches in the development program: "(1) The use of an IRBM Missile as a booster, and (2) The physical recovery of reconnaissance photographs from the orbiting vehicle." Both approaches had been a part of Lockheed's over-all program concept from the inception but Lockheed had shelved the approaches because of initial funding limitations.[51] RAND ~~had earlier~~ also proposed a method that was quite similar in its report An Early Reconnaissance Satellite System (RM-2012), 12 November 1957.

In early January 1958, Lockheed issued its development plan and cost estimates of acceleration of WS 117L in response to requests by AFBMD to consider attaining pioneer reconnaissance capability by March 1960. The plan also included introduction of Thor missile into the program as a booster vehicle. Preliminary considerations of program acceleration had been presented to Major General B. A. Schriever on 5 December 1957 at which time Mr. Robert Gross, President of Lockheed Aircraft Corporation and Chairman of Board of Directors, stated that Lockheed would draw on its entire facility as necessary to expedite the WS-117L development. 53: 52

Late in December 1957, Schriever had notified Lockheed . he thought "it highly desirable that specific development planning toward the augmentation and acceleration of the present WS 117L program be accomplished without delay between LMSD and AFBMD." 52: 53

Late. in November, the Air Force approved WS 117L Development Plan AFBMD had submitted 16 July 1957 but asked for a revised development plan with new goals and objectives outlined. In addition the Deputy Director of Research and Development Office, Air Force Headquarters, Headquarters USAF, recommended that the revised plan: (1) restate the expected capabilities as design objectives; (2) provide more detailed information on the development and testing of the airborne and ground components of the sensor systems, and (3) furnish more detailed information and drawings of each sub-system. 52. 54 The revised development plan was submitted 15 March 1958 and later updated to 1 July 1958. In order to accelerate the program, the plan specified interim use of Thor missiles as boosters.

During the last half calendar year 1957, there was considerable activity at Air Force Ballistic Missile Division in the area of site selection and facilities for WS 117L, combined WS 107A-1 and WS 117L basic integration plan for operations at AFMTC; and plans for subsequent use of Cooke Air Force Base * for testing. Site selection was accomplished at Cooke Air Force Base for WS 117L test, tracking, control, and data read out station. Preliminary siting surveys were conducted in Hawaiian Islands for WS 117L test, tracking, command and telemetry station.

x ? auth

Congress had adjourned on 30 August 1957 so it was not in session when Sputniks I and II were launched. However after the launches Congress called various committees ~~were called~~ into action. Honorable George H. Mahon, Congressman, State of Texas, and Chairman of the Subcommittee on Department of Defense Appropriations, Appropriations Committee, House of Representatives, called a meeting of his Committee for 20 November, in Washington, D. C. for the purpose of

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* Dedicated 4 October 1957 and later redesignated Vandenberg AFB

exploring with Secretary of Defense McElroy, Deputy Secretary of Defense Quarles and others, the ballistic missile and satellite programs of the Department of Defense.~~52~~ 55

~~52. Press Release No. 57-18~~

Some members * of the subcommittee visited the Air Force Ballistic Missile Division and associated facilites on the West Coast for a first hand look at the status of the Air Force Ballistic Missile Program in preparation for the called meeting. Honorable William M. Holaday,** Special Assistant to the Secretary of Defense for Guided Missiles, also participated in the meetings. However, except for discussing the Thor Program and Cooke Air Force Base, WS 117L was not a part of the briefing presented to the group on 4 November 1957 at AFBMD. Dr. Dunn of Ramo-Wooldridge Corporation discussed the "Evolution of the USSR Satellite" and why the USSR was ahead of the U. S. A. in the missile race.

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* George H. Mahon, Chairman, 19th District, Lubbock, Texas; George W. Andrews, 3d District, Union Springs, Alabama; H. C. Ostertag, 395h District, Attica, New York; Errett P. Scrivner, 2d District, Kansas City, Kansas; Robert L. F. Sikes, 3d District, Crestview, Florida; Richard B. Wigglesworth, 13th District, Milton, Massachusetts; Staff Assistants to Committee: Sam Crosby, Carl Silsby and a Mr. Preston. Military Staff attached to committee were: Colonel Lee Baker, U. S. Air Force; Colonel R. E. Coffin, U. S. Army; Commander Ernest W. Dobie, U. S. Navy and LtCol Regan Scurlock, U. S. Air Force.

** Reassigned to Office of Director of Guided Missiles (an office created to replace the abolished Office of Special Assistant for Guided Missiles) on 15 Nov 57. Other representatives from DOD were Mr. A. W. Waggoner, Executive to Assistant Secretary of Defense for Guided Missiles; Colonel D. E. Williams, Military Assistant to Mr. Holiday; Mr. D. W. Patterson. R & D.

Hearings before the Preparedness Investigating Subcommittee members* of the Armed Services Committee of the Committee on Armed Services, United States Senate, began on 25 November 1957 for the purpose of inquiring into the facts on the state of the Nation's security and Russia's scientific achievement. Among the witnesses who testified were MajGen Bernard A Schriever, and officials from aircraft companies and corporations.

Robert E. Gross, Chairman of the Board, Lockheed Aircraft Corporation; L. Eugene Root, Vice President of Lockheed and General Manager of the Missile Systems Division; and R. A. Bailey, Chief Advanced Systems Research Engineer, Lockheed California Division; appeared as witnesses on 15 January 1958 at which time Mr. Root explained the WS 117L program to the subcommitee and explained that the corporation had just submitted an accelrated plan which called for the use of Thor as a booster for the aerial reconnaissance system,[56] about which General Schriever had made a statement. General Schriever had testified on 9 January about WS 117L and further that

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* The Preparedness Subcommittee/was made up of seven members: Senator Johnson of Texas, Senator Kefauver, Senator Stennis, Senator Symington, [illegible] Senator Bridges, Senator Saltonstall, and Senator Flanders. Each member of the Armed Services Committee was an ex officio member of the Preparedness Subcommittee.wh The subcommittee was set up in 1950, and had been operating under authorization of the Senate since that time.

> we have been looking at means for accelerating it, and I have given verbal instructions--and this will be carried out in contractual terms--to bring into this program the Thor as a booster to expedite getting orbiting vehicles and we think, based on our studies to date--and we have made rather exhaustive studies both in house and in Lockheed--that we can get before the end of this year, say sometime around perhaps as early as July, but more likely about October, we can get an orbiting vehicle with the Thor as a booster, which would be a boost to this program here.

On 21 November 1957, Douglas Aircraft Company, Inc., made a presentation at Air Force Ballistic Missile Division which summarized progress on a study of the feasibility of using Thor missiles for space flight testing. Air Force Ballistic Missile Division, Ramo-Wooldridge and Douglas Aircraft Corporation, Inc., agreed on certain performance capabilities and that there appeared to be no problems that would prevent an early satellite launch but that some factors required further investigation. It was proposed that a Thor carrying fuel instrumentation as well as an AC Guidance System could place a 50-100 pound satellite on an orbit at an altitude averaging 300 miles. The proposal called for the use of a Vanguard solid rocket * for a second stage. A second proposal called for a Thor missile with two additional stages consisting of a cluster of four Vanguard solid rockets and a single Vanguard solid rocket that could place approximately 50 pounds on a flight to the moon.~~[56]~~ [57]

A meeting was held in the commander's office at Air Force Ballistic Missile Division on 30 December 1957, for the purpose of discussing the re-entry test program associated with use of the Thor booster, the Vanguard's second stage and a GE nose cone. Persons present included Major General Schriever, Brigadier General Ritland, Colonels Terhune and Norton, Lieutenant Colonel Beryl L. Boatman, AFBMD; Brigadier General Ben I. Funk, Ballistic

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* Hypergolic-fueled modified Vanguard made by Aerojet-General Corporation. After first stage Thor's fuel became exhausted, a signal would be transmitted to the second-stage Vanguard, exploding the connecting bolts and starting the hypergolic second stage propellants. Second-stage guidance would be accomplished through autopilot control similar to the first stage.[55] [illegible]

Missiles Center; and Drs. Ramo, Dunn and Mettler of Ramo-Wooldridge Corporation.

After considerable discussion concerning management and technical aspects of the program, General Schriever authorized a re-entry program designed to provide a capability for testing conditions at ranges of 5,500 nautical miles or less, for nose cone designs other than those envisioned in the ICBM or IRBM programs.

The plans provided that ten Thor boosters would be set aside for the program and that the program would be conducted in two phases. Ramo-Wooldridge had already initiated the first phase concurrently with Aerojet Corporation (for second stage) and General Electric (nose cone).[57] [58] Plans provided for Douglas Aircraft Company, Inc., to act as the primary contractor to provide necessary inputs concerning structural and dynamic consideratons of the Thor airframe as related to three flights, and for phase two of the program to begin immediately and run concurrently with the action in the first three flights.[58] [59]

For administration, Colonel Charles H. Terhune, Jr., Deputy Commander for Weapons Systems requested the Director, WS-315A (Thor) assign Project Able to the WS-315A Office on a temporary basis. Lieutenant Colonel Richard K. Jacobson Director, WS 315-A /assigned Project Able to the Thor Office on 21 January 1958 and assigned Major Donald R. Latham and Captain John E. Richards of the Armament Division on to the project on a temporary basis for the duration of the project work concerned "with monitoring the activities of R-W and the R-W subcontractors, Aerojet-General and GE/MOSD as their work pertains to the second stage/nose cone combination." 60 59

Two of the Thor missiles (Numbers 116 and 118) originally proposed for use, and Thor missile Number 119 were used for the project that became knows as Project Able, a name applied to space projects to designate the series of Air Force flight test to investigate ablating heat protection materials for re-entry. The first three Able-0 vehicles carried mice in a small space in the nose cone that made possible a biomedical sub-experiment - Project MIA (Mouse-In-Able), were designed primarily as advanced Re-entry test vehicles. The launches took place on 23 April, 9 July 1958, and 23 July 1958. The mice were placed "in a specially fabricated compartment within the nose cone equipped with air purifying and breathing apparatus." That part of the Air Force experimentation was conducted to identify and solve the problems which would confront Man-In-Space.~~[60]~~ [61]

The first flight (Thor No. 116) was a failure. The main engine shut down due to turbopump failure at 146 seconds and there was no second stage ignition.~~[61]~~ [62] The last two missiles traveled over 5,000 nautical miles from launch point but there was no recovery.~~[62]~~ [63]

The next phase (lunar probes) / AFBMD started concurrently with the three Able-0 flights was transferred to the newly Department of Defense organized Advanced Research and Projects Agency (ARPA).~~[63]~~ [64]

On 17 December 1957 when General Schriever appeared as a witness before the Preparedness Investigating Subcommittee of the Committee on Armed Services, United States Senate, he had testified he opposed the establishment of an organization in Department of Defense that would separate research and development of military weapons from the user because it would extend time from the initiation of development to the time a program became operational. General Schriever stated: "So this is one reason that I want to put a strong negative on this proposed Advanced

Research Projects Agency Agency that I have been reading something about in the newspapers, because if it does become . . . . If it does become an operating management agency, I think it will be a very serious mistake." 65 ~~64~~

Nevertheless ~~However~~, Defense Secretary McElroy activated the Advanced Research Projects Agency on 7 February 1958, and ARPA became operating management agency for the three Lunar Probe launches. ARPA Order Number 2-58, 27 March 1958, directed AFBMD to proceed with three Lunar probes with Thor as first stage, Vanguard second stage as the second stage and a solid rocket as third stage. AFBMD launched one lunar probe vehicle, Code Name Pioneer I,* on 11 October 1958, which did not orbit but attained an altitude of about 71,300 statute miles. The National

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* Thor-Able-1, a four stage rocket weighing approximately 112,000 pounds, consisting of three booster stages and a terminal stage composed of 8 vernier rockets, an orbit injection rocket, and a payload. The first stage was a Thor vehicle (liquid) without major changes; the second stage, a welded type 410 stainless steel structure was an Aerojet Model AF 10-101 liquid rocket (Vanguard second stage) propulsion system; the third stage, developed by the Allegheny Ballistics Laboratory was an ABL X-248-A3 solid rocket (Vanguard third stage); the fourth stage was a solid propellant motor developed by the Thiokol Chemical Corporation (TX 8 motor modified and designated TS 8-6).

Aeronautics and Space Administration (NASA) claimed* that launch although NASA had only been established on 1 October 1958. The President had asked Congress for a civilian agency on 2 April 1958, to conduct all space activities except those primarily associated with military requirements, and Congress had approved the "National Aeronautics and Space Act of 1958" on 29 July 1958. President Eisenhower had approved the Lunar Probe Program on 24 March 1958, subject to review to determine which programs would be under the cognizance of the new agency when and if a civilian space agency was created.[65] 16

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* NASA reported in Aeronautics and Astronautics, An American Chronology of Science and Technology in the Exploration of Space 1915-1960, by Eugene M. Emme, NASA Historian, as follows: PIONEER I, U. S. - IGY space probe under direction of NASA and with the AFBMD as executive agent, launched from AMR, Cape Canaveral, Fla., by a Thor-Able-I booster. It traveled 70,700 miles before returning to earth, determined radial extent of great radiation belt, first observations of earth's and interplanetary magnetic field, and first measurements of micrometeorite density in interplanetary space.

On 27 August 1958, ARPA requested that NASA observers for orientation purposed "be allowed complete access to details of work at BMD and contractor installations as necessary." ARPA The request ~~was~~ made in anticipation that management responsibility for the work would be transferred to National Aeronautics and Space Administration at a future date. The observers as named were Newell Sanders, Harry Goett and Alfred J. Egger, Jr. 67

Immediately prior to the Lunar Probe launch on 11 October 1958, a Mr. Mulholland, former representative of National Advisory Committee for Aeronautics on West Coast* indicated that NASA possibly desired representation in the data center and/or TWX room at AFBMD during the next Lunar Probe activities. The President transferred the Lunar Probe Pro~~gram~~ject to NASA by Executive Order on 1 October 1958 and Administrator T. Keith Glennan advised

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* The NASA was activated and the NACA was abolished at the close of business 30 September 1958, with all personnel and facilities transferred to the new agency. At the same time, major control of space activities in the Department of Defense was transferred to NASA. Project Vanguard personnel of the Navy were moved to NASA. Two Air Force and two Army lunar probes were transferred, but the services retained actual work of construction and launching.

General Samuel E. Anderson, Commander, ARDC, on 9 October 1958 that NASA desired the transfer of ARPA Lunar Probe Project be accomplished without interruption to work at AFBMD, and issued NASA Request No. HS-2, 9 October 1958, subject: Continuation of Work begun Under ARPA Order No. 2-58. ARDC airmailed the correspondence pertaining to the transfer of the Lunar Probe Project ~~to NASA~~ to Commander, AFBMD on Friday 17 October 1958. Considering the circumstances, it is not likely that NASA participated in the launch of Pioneer I on 11 October 1958 to any greater extent than noted above, expecially in view of the fact the Commander of Air Force Ballistic Missile Division did not know about the transfer of the Lunar Probe Project to NASA until after the launch of Pioneer I.[68]

The Able programs continued with Able-Phase II re-entry test vehicles under AFBMD management; earth satellite, lunar orbit, solar orbit and earth satellite cloud cover launches under NASA management; earth satellite doppler navigational Repeater Communication under ARPA and doppler navigational aid system under ARPA and ARPA/Navy management, all with Thor missiles as boosters until an Atlas * booster was used for NASA lunar orbit launch on 26 November 1959. All launches were successful

* Note on next page

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*Atlas 10B, equipped with a lightweight, pressurized, non-separable nose faring, and two special Signal Corps communication packages, each consisting of a recorder, receiver, transmitter, batteries, control system and a Minitrack system, was launched 18 December 1958 from Cape Canaveral. The flight, known as Project SCORE (Signal Communications by Orbiting Relay Equipment) was a complete success with all flight objectives attained. The one and one-half stage vehicle was the sixteenth Atlas missile that had been launched. After the half stage (two engines) dropped off, the missile weighing over four tons reached 111.4 statute miles above the Earth and began its first orbit. On signal the following day, the taped message carried aloft in the missile began broadcasting alternately by voice and ~~[illegible]~~ continuous wave the following message, the first from outer space.

> This is the President of the United States speaking. Through the marvels of scientific advance my voice is coming to you from a satellite travelling in outer space. My message is a simple one. Through this unique means I convey to you and all mankind America's wish for peace on Earth and good will toward men everywhere.

After thirteen days of communications, the missile ~~dee~~ stayed in orbit until it decayed 21 January 1958. (For a more comprehensive history, see Appendix ___________) flights proving the value of Thor as a booster for military space programs.[68] [69]

For a more comprehensive history of the Able programs, see Apendix No. ___ .

The Able program contributed to Air Force overall capability to operate in space effectively and provided a somewhat satisfactory counter to the Sputniks, inasmuch as the program was related to the United States cold war effort.[69] [70] However, throughout 1958, the military reconnaissance system had made less spectacular gains. There had been many changes in funding levels, changes in area of responsibility for the program and the beginning of a breaking out or separation of program objectives.

FOOTNOTES

1. Ltr, (TSEON) BrigGen Alden R. Crawford, Chief, Engineering Division to COAF, USAF, Subj: Project RAND, Satellite Vehicle, 8 Dec 57.

2. Ltr, MajGen Crawford to Douglas Aircraft Co., Inc., Attn: Mr. F. R. Collbohm, subj: Satellite Project, 17 Feb 48.

3. ARDC Project Development Directive No. 1115, 14 Sep 54; Historical Report Weapon System 117L, 1 Jan-31 Dec 56, prepared by Alfred Rockefeller, Jr., Historian Western Development Division (ARDC), 15 Apr 57.

4. Historical Report WS 117L by Rockefeller

5. Ibid.

6. Ibid

7. DF from WCSG to WCIPP, 14 Dec 54, subj: Project Nickname, Comment No. 1 date 14 Dec 54 and Comment No. 2 dated 17 Dec 54.

8. Memorandum, General Thomas D. White to Deputy Chiefs of Staff, 14 May 54, subj: Project ATLAS.

9. Personnel Assignment Memorandum No. 8, Hq USAF, 27 May 54; SO 142 DAF, 23 Jul 54.

10. Memorandum to Colonel Sheppard from Colonel Charles H. Terhune, Jr., 3 Nov 54, subj: Proposed Visit of Majors Green and Riepe, WADC Project Officers for 1500-Mile Tactical Missile and Satellite, Respectively, to WDD.

11. Memorandum for General Schriever from Colonel Harold W. Norton, 8 Jul 55, subj: Satellite Presentation.

12. WDTD Memorandum for General Schirever, 7 Oct 55, Subj; Satellites: An Essay submitted to The Robert H. Goddard Historical Essay Competition by R. Cargill Hall, October, 1963.

13. Memorandum for General Schriever from Colonel Harold W. Norton, 7 Oct 55, subj: Satellites.

14. Ltr, WDS, LtCol John B. Hudson to Distribution, 10 Feb 56, subj: Reorganization and Religment of Functions of Technical Operations (WDT).

15. Report of Contractor Evaluation Board, WS 117L, 20 Mar 56.

16. Msg, RDGE-5-23-E, 22 May 56.

17. Memorandum for Colonel Terhune from R. C. Trusx, Commander, USN, Assistant Deputy for WS 117L, Technical Operations, 12 June 1956, subj: Status of WS 117L Program as of 12 Jun 56.

18. USAF Development Directive Number 85, 3 Aug 56.

19. *Ibid.*; AMCR 11-14, Work Priorities for USAF Logistical Support Tasks, 6 Apr 54.

20. Ltr, Colonel Charles H. Terhune, Jr., Thru Commander ARDC to Deputy Chief of Staff, Development, Headquarters, USAF, 28 Aug 56; Requirement for Additional FY 1957 Funds for WS 117L; Msg, RDZGW-10-3-E, 11 Oct 56; Msg, AFDRD Cite 57697, 22 Oct 56.

21. Ltr, WDTR, Terhune, to Director of Research and Development, Hq USAF, 21 Nov 56, subj: Fund Requirements for Weapon System 117L Program w/1st Ind, ARDC (RDZGW), 26 Nov 56, same subject.

22. Ltr, DAF, to Comdr ARDC, 10 Dec 56, subj: (Uncl) Requirement for Additional FY 1957 Funds for WS 117L.

23. Summary of the Advance Reconnaissance System Development, p3 (Inclosure 2 to DF(9 May 57) from Maj Dillon [Maj F. K. Dillon, Hq USAF, DCS/D/ [illegible]

24. Ibid.

25 Msg, AFDRD-SS 47017, 1 Feb 57; Msg WDTR 2-2-E, 9 Feb 57.

26. Ltr, LtGen D. L. Putt, to Comdr ARDC, 6 Jan 57, subj: Planning and Funding Requirements for WS 117L.

27. Personnel Actions Memorandum (~~PAM~~) (PERAM) No. 28, WDD, 7 Sep 56.

28. ~~PAM~~ PERAM No. 16, WDD, 5 Jul 56.

29. ~~Pam~~ PERAM No. 21, WDD, 16 Aug 56.

30. ~~PAM~~ PERAM No. 40, WDD, 2 Nov 56.

31. ~~PAM~~ PERAM No. 48, WDD, 19 Dec 56.

32. ~~1957 PAMS not Available. — Alts will order~~ PERAM No 34 AFBMD, 28 Jun 57

33. ARS Development Plan, WDD, 15 Mar 58 as amended to 1 Jul 58; DF, MCPTA (BMO) 18 Jul 57, subj: Weekly Diary, 12 Jul Thru 18 Jul 57.

34. Revised DP dated 2 Apr 57.

35. Statement submitted by Major General Bernard A. Schriever, Commander, Air Force Ballistic Missile Division, Hearings of the Senate Subcommittee on Preparedness Investigating 17 December 1957.

35 ~~36~~. GO No. 19, ARDC 21 May 57.

37. Memorandum for General LeMay 10 Oct 57 from James Douglas, Secretary of the Air Force, subj: WS 117L.

38. Msg AFDRD-SS 51476, 15 Oct 57.

39. Msg, AFMPP 51689, 18 Oct 57.

DAF
40. /Memorandum for Chairman, Scientific Advisory Board, 15 May 57, subj: SAB Special Study of Advanced Weapon Technology and Environment

41. Ltr, LtGen Putt to LtGen S. E. Anderson, Comdr ARDC, 17 Oct 57, no subj; Memorandum for the Record, Colonel Frederic C. E. Oder, 25 Oct 57.

42. Memo for Col Terhune from Col Oder, 31 Oct 57, subj: Informal Reaction of the "Stewart" Committee on Special Capabilities to the 18 October Presentation on WS 117L.

41. Scientific Advisory Board Ad Hoc Committee on Advanced Weapons Technology and Environment, 9 Oct 57.

42. Ltr, LtGen Putt to LtGen S. E. Anderson, Comdr ARDC, 17 Oct 57, no subj; Memorandum for the Record, Colonel Frederic C. E. Oder, 25 Oct 57.

43. Memo for Col Terhune from Col Oder, 31 Oct 57, subj: Informal Reaction of the "Stewart" Committee on Special Capabilities to the 18 October Presentation on WS 117L

44. Ibid. 45 + 46 see pages 32a 32b

47 ~~45.~~ Memorandum for Secretary of Defense from Richard E. Horner, Asst Secy of Air Force (R&D), 12 Nov 57, subj: Outer Space

48 ~~46.~~ Msg, 11-033, Comdr ARDC to Comdr AFBMD, 13 Nov 57; Msg, ?DZCP-12-4-E, 4 Dec 57; Msg, 02-022, Comdr to Comdr AFBMD, 14 Feb 58; [illegible] chronology AFBMD 11-(4.0=3) 1960 [illegible]

49 ~~47.~~ ARS Development Plan, 1 Jul 58, p I-2-1; Operations Order Serial No AFBMD 2-58, 1 Aug 58

50 ~~48.~~ Msg, AFMPP 52392, 5 Nov 57.

51 ~~49.~~ Introduction to WS 117L Development Plan for Program Acceleration (LMSD-2832), prepared by Missile Systems Division, Lockheed Aircraft Corp, 6 Jan 58, Para 4.7;

52 ~~50.~~ Foreword, WS 117L Development Plan for Program Acceleration, Lockheed Aircraft Corporation.

53 ~~51.~~ Ltr, WDTR, Schriever to Mr. L. Eugene Root, Vice Pres and General Mgr Lockheed Aircraft Corporation, Missile Systems Division, 23 Dec 57, no subj.

54 ~~52.~~ Ltr, AFDRD-SS, BrigGen H. A. Boushey to Comdr, ARDC, 27 Nov 57, subj: Approval of Development Plan for WS 117L.

55 ~~53.~~ Press Release No. 57-13.

56 ~~54.~~ Hearings before the Preparedness Investigating Subcommittee on the Committee on Armed Services United States Senate Eighty-fifth Congress, p 1854, Part 2.

~~55.~~ News Release No. 58-5, Project Able Fact Sheet.

57 ~~56.~~ WDD (WDTIA) Memorandum for the Record, LtCol Sidney Greene, 22 Nov 57, subj: Study of THOR for Space Flight Testing.

58 ~~57.~~ Memorandum for Colonel Terhune from Col Edward N. Hall, Director, Weapon System 315A, 14 May 57, subj: Vanguard, with 2 Incls: 1. Copy Memo for General Schriever from LtCol Emmett J. Kelly, WDD liaison Officer, ABMA, Huntsville, Ala, 19 Apr 57, subj: Satellite Study; 2. Ltr, Ramo-Wooldridge to Col E. N. Hall, 3 May 57, subj: Transmitting copy of GM67.3-49, with 1 Incl, Study, Proposed Use of IRBM as Booster for Multi-Stage Vehicle, 1 Apr 57; Ltr, Ramo-Wooldridge, L. G. Ludwig to L. G. Dunn, 19 Dec 57, subj: Contractor Organization for Project Able.

59 ~~58.~~ WDD (WDT) Memorandum for Generals Schriever and Ritland, 6 Jan 58, subj: Re-entry Test Program.

60 ~~59.~~ WDD (WDTI) Memorandum for Col Terhune fr LtCol Richard K. Jacobson, 21 Jan 58, subj: Assignment of Project Able; News Release 58-5, Project Able Fact Sheet.

61 ~~60.~~ Msg, SAFIS-3C 47151, 29 Apr 58.

62 ~~61.~~ Thor Flight Summary - Flight Test No. 14, 24 Apr 58.

63 ~~62.~~ Thor Flight Summary - Flight Test No. 17, 9 Jul 58; Thor Flight Summary - Flight Test No. 19, 23 Jul 58.

64 ~~63.~~ DOD Directive No. 5105.15, 7 Feb 58, subj: Department of Defense Advanced Research Projects Agency; Dod News Release No. 288-58 (for release 27 Mar 58) subj: Secretary McElroy Announces New Space Programs.

65 ~~64.~~ Hearings before the Preparedness Investigating Subcommittee on the Committee on Armed Services, United States Senate, 85th Congress, first and Second Sessions, Part I, p. 1001.

66 ~~65~~. 1958 NASA/USAF Space Probes (Able 1) Final Report prepared for AFBMD by Space Technology Laboratories, Inc., 18 Feb 59; Memorandum for The Secretary of Defense, 24 Mar 58, from Dwight Eisenhower.

67 ~~66~~. Msg, DEF 363129 from OSD ARPA, 27 Aug 58.

68 ~~67~~. WDD (WDGE) Memorandum for General Schriever and General Ritland, 2 Oct 58, subj: NASA Representation at Coming Lunar Shot; NASA Ltr to Gen Samuel E. Anderson, Comdr, ARDC, subj: Continuation of Lunar Probe Projects, with Incl: NASA Request No. HS-2, 9 Oct 58, subj: Continuation of Work Begun Under ARPA Order No. 2-58; Report of the Select Committee on Astronautics and Space Exploration, 85th Congress, 2d Session; Msg, RDZCW-10-34, 24 Oct 58.

69 ~~68~~. STL Space Log, Vol 1, No. 1, 1 Jul 60; History of Project Score prepared by Dr. Frederick B. Heath, AFBMD Historian, 15 Jul 59.

70 ~~69~~. WDD (WDGM) Memorandum for General Schriever, 1 Apr 58, subj: Message from SAFIS.

THOR AUGMENTED WS 117L SYSTEM

The military reconnaissance satellite (WS 117L) that had had insufficient funding since the Air Force issued General Operating Requirement No. 80, 15 March 1955, was still suffering for lack of funds when Secretary McElroy granted his authorization of 1 November 1957 to pursue the WS 117L Program on a maximum effort basis. In addition to unstable funding, the program was hampered by a low priority rating;[x] overtime restrictions which "limited overtime on Air Force Programs other than ballistic missiles to two percent of programmed manhours,[x] and McElroy's the transfer of the program to ARPA.

In the area of responsibility, on 12 November 1957, the Air Force had requested "Secretary of Defense assign to the Air Force responsibility for all military satellites including, of course, WS 117L which was to be accelerated."[x]

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[x] Ltr, WDD (WDTR) to Comdr ARDC, 13 Nov 57, subj: Priority of Systems Development.

[x] Ltr, BMO (MCPTRM) to DAF, 27 Nov 57, subj: Overtime Policy - 117L Program.

[x] An Air Force History of Space Activities 1945-1959 by Lee Bowen, USAF Historical Division Liaison Office, p 127.

The Secretary of Defense had not answered the Memorandum from J. H. Douglas dated 12 November 1957, so on 1 February 1958, Douglas again requested the Secretary of Defense to sign a directive, the effect of which "would be to direct the Air Force to continue this project subject to the overall direction of ARPA and, pending its definitive establishment, of the Director of Guided Missiles in the same manner as has been done through assignment to the Army of the development of an anti-missile missile through your directive of January 16."[x] There was no answer from the Secretary of Defense until 28 February 1958 after McElroy had activated ARPA on 7 February 1958. By that time Assistant Secretary of the Air Force Dudley C. Sharp had lifted the overtime restriction,[x] the Air Force Chief of Staff had approved the acceleration of WS 117L Program[x] and the president had directed that the highest and equal national priority be given to WS 117L.[x]

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[x] Memo to SOD, 1 Feb 58, subj: Reconnaissance Satellite.

[x] BMC (MCPTA) Weekly Diary - 10 thru 16 Jan 58, 16 Jan 58.

[x] Msg, AFDDC-SP 55521, 22 Jan 58

[x] Msg, AFMPP-WS-1 55965, 31 Jan 58

In memorandum for Secretary of the Air Force, 28 February 1958, Roy Johnson, Director of Advanced Research Projects Agency, indicated his greater interest in a Man-In-Space program than in a recoverable reconnaissance system by noting that a Thor booster

> combined with a second stage which carries a lightweight payload in the form of a recoverable capsule, duplicates rather than compliments the ATLAS 117L capability. The interim system would give only a small improvement in time over the ATLAS 117L. Moreover, the successful and continuous operation of a recoverable reconnaissance system with the attendant requirement for search, appears infeasible from a practical and useable military point of view. Accordingly, the development of the interim system should not be pursued. . . . I understand that a THOR booster with a suitable second stage vehicle may be the most promptly and readily available device for experimental flights with laboratory animals. The development of such hardware is authorized for the recovery of the animals, in furtherance of the objective of manned satellite flight.[x]

On March 1958, the Air Force notified Commander Air Research and Development Command that the Office of Secretary of Defense had approved acceleration of WS 117L to include "launching military satellite test vehicles based on the Thor booster," and had directed submission of "completed development plan and supporting fiscal estimate on this accelerated program by 15 March 58 for review and approval."[x]

Air Force Ballistic Missile Division submitted its WS 117L Development Plan dated 15 March 1958 to Assistant Chief of Staff for Guided

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[x] Msg, AFCVS 57197, 3 Mar 58.

Missiles, Headquarters, USAF, on 25 March 1958. The Funding Program included $60.586M for Fiscal Year 1958 and $214.907 for Fiscal Year 1959. In order to achieve early orbital capability, the plan provided for interim use of the Thor booster in accordance with the earlier DOD approval.

Air Force Ballistic Missile Division submitted its WS 117L Development Plan to the Assistant Chief of Staff for Guided Missiles, Headquarters, USAF, because the Chief of Staff, USAF, had "directed that WS 117L and other space projects which depend upon the use of ICBM/IRBM components will be administered in the same procedures as the ICBM/IRBM programs."[x] The ICBM/IRBM programs had been administered in accordance with management procedures as prescribed in a memorandum dated 14 November 1955, which had established the Air Force Ballistic Missile Committee.* The management procedures concept of operation for the ICBM and IRBM (Thor) were contained in "Air Force Plan for Simplifying Administrative Procedures for the ICBM and IRBM Programs," (Gillette Procedures)* dated 10 November 1955.

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[x] DAF Memorandum, 4 Mar 58, subj: Space Projects Involving ICBM/IRBM Components.

* Committee members were: Secretary of the Air Force, Chairman; Assistant Secretary (Research and Development), Vice Chairman; Assistant Secretary (Materiel); Assistant Secretary (Financial Management): Assistant Chief of Staff for Guided Missiles. The Office of the Assistant Chief of Staff for Guided Missiles provided the Secretariat for the Committee, who was Colonel Ray E. Soper until after the fifteenth meeting held 21 March 1958.

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* The common title for the procedures was "Gillette Procedures" named after the Chairman of Joint Evaluation Group that developed the procedures, Hyde Gillette.

The Gillette Procedures specified that after the Air Force Ballistic Missile Committee had approved development plans, the plans would constitute "the only authority under which all other actions of the Air Force, including programming, budgeting and financing actions, would be implemented and no actions would be authorized that were not included in an approved Development Plan." x

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x/DAF Memorandum for Asst Secy (R&D), Asst Secy (Financial Mgmt), Asst Secy (Materiel), Chief of Staff, 14 Nov 55; [illegible] Air Force Plan (Revised) for Simplifying Procedures for the ICBM and IRBM Programs, 10 Nov 55; ~~Ltr~~ DAF Ltr to Members of the Joint Evaluation Group from Hyde Gillette, Chmn, 15 Sep 55. ~~AFBMS~~ Minutes of AFBMC Meetings, 1 thru 15.

On 9 April 1958, the Assistant Chief of Staff for Guided Missiles, Headquarters, USAF, notified Commander, Air Force Ballistic Missile Division that for 1959 funding for WS-117L only $152.0M had been approved for planning purposes and directed that AFBMD revise the financial annex of the development plan to conform to that planning amount. x

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x Msg, AFCGM 59270, 9 Apr 58.

The Commander, AFBMD, replied that "Two new planning factors have been introduced since the 15 March 1958 Development Plan was submitted . . . . First, Atlas boosters and related support costs can logically be charged to the WS 107A-1 program." The basis for that view was that launches scheduled for WS 117L had direct application to research and development and training phases of the Atlas program. The change reduced the financial play for FY 1959 in the amount of $35.0M. The development plan had not included Thor boosters in the WS 117L financial plan. The second factor was "that an improved WS 117L engine using Unsymmetrical Di-Methyl Hydrazine (UDMH) as fuel is urgently required for the later Thor-boosted flights to substantially increase the payload on orbit and increase the chance of achieving an optimum orbit." The change required an increase of $6.0M in the FY 1959 Financial Plan for WS 117L. AFBMD requested authority be granted to estimate Atlas boosters and related costs to the WS 107A-1 program and approval of $185.0M for FY 1959 Financial Plan for WS 117L.[x]

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[x] Ltr, WDD (WDTSR), 21 Apr 58, [illegible] subj: Reduced FY 59 Program for WS 117L.

~~x Headquarters, USAF approved a level of $185.9M in principle and asked~~

Headquarters, USAF, approved a level of $185.9M in principle and asked for "a detailed financial plan accordingly for submission to this Hqs not later than 1 June 1958." Headquarters USAF further directed that

"Pending formal approval of Development Plan by ARPA rpt ARPA you are authorized to negotiate with the prime contractor on the basis of an initial program rate of $152.0 million providing necessary flexibility to adjust during FY 1959 to a total of $185.9 million."[x]

X Msg, AFCVC 50190, 29 Apr 58.

AFBMD prepared Change 1 for planning purposes only, which was superseded by Change 2 dated 1 July 1958. Change 2 provided for Fiscal Year 1958 Financial Plan in the amount of $66.966M and a Fiscal Year 1959 Financial Plan in the amount of $197.9M. AFBMD had added $12.0M to $185.9M for the financing of Thor boosters.[x]

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x Msg, AFCGM 51207, 23 May 58; Memorandum for the Director, ARPA, 12 Jun 58, from Malcolm A. MacIntyre, Under Secretary of Air Force; Advanced Reconnaissance System Development Plan (New Horizon Program) 1 Jul 58.

By the time AFBMD had submitted its revised development plan, the Secretary of Defense had transferred WS 117L program to ARPA as of 19 May 1958. ARPA immediately changed the name of the program from WS 117L to "Sentry" and specified that "neither the name or the project is to receive any publicity without clearance through ARPA."[x]

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x Msg, RDZGW 6-1-58, 4 Jun 58.

On 30 June 1958, ARPA issued ARPA Order No. 9-58 announcing that Secretary of Defense had approved "the assumption of responsibility by ARPA for the Advanced Reconnaissance Satellite (WS 117L)." ARPA further requested that AFBMD continue with the program on behalf of ARPA and directed that AFBMD submit a detailed development and related financial plan covering the program. The order made available $22.7M for obligation by AFBMD on behalf of ARPA, only for purposes "necessary to accomplish the work specified in the order." Although other than to continue with the program the order did not clearly specify the work to be accomplished or furnish any guidance.

Malcolm A. MacIntyre, Under Secretary of the Air Force, had discussed WS 117L financial aspects ~~of the WS 117L program~~ with the Director of ARPA on 11 June 1958 and agreed that "the FY 59 development program for Weapons System 117L will be programmed at a level requiring financial support in the amount of approximately $197 million." ~~and that~~ It was understood that the $152 million currently identified in the ARPA budget for the support of the project will be augmented" by Air Force funds, for

[illegible]

application to the WS 117L program of? "$12 million currently programmed to buy THOR boosters." It was further agreed that $8.0M would be allocated to WS 117L development from resources available to ARPA leaving $25.0M the Air Force would provide to ARPA through "reprogramming of resources in the Air Force budget and transfer of funds."x

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x DAF : Memorandum for the Director, ARPA, 12 Jun 58, from Malcolm A. MacIntyre, Under Secretary

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[illegible] The AFBMC had convened on 18 June 1958 to review the revised development plan for WS 117L based on reduced funding ceiling, as USAF had requested at which time AFBMD briefed the AFBMC, pointing out changes in the program since the last presentation on 14 March 1958. Altogether six programmed Atlas boosted flights had been deleted; a Pioneer visual reconnaissance satellite launch date had slipped from March to May 1960; and a Pioneer ferret launch date had slipped from April to August 1960. The AFBMC noted the changes and the effect of the reduced funding and that none of the development objectives had been deleted, although a delay was expected in the Infrared warning capability. The Chairman of the AFBMC furnished each member of the committee a copy of a Memorandum for the Director, ARPA, 12 June 1958, from Under Secretary of the Air Force, Malcolm A. MacIntyre, to [illegible] Director, ARPA in which MacIntyre outlined the WS 117L financial funding agreement between the ARPA Director and the Air Force. The AFBMC directed that the plan be presented for approval to the Director, ARPA.[x]

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[x] Minutes of the Twentieth Meeting AFBMC, 8 July 1958.

On 29 July 1958, Roy W. Johnson, Director of ARPA, notified the Secretary of Air Force that he had not approved the "amended Development Plan since we understand informally from representatives of BMD that the program presented on June 24, plus the bio-medical project, must be further amended to accommodate it within the available funds of $215 million."[x]

ARPA Memorandum for the Secretary of the Air Force, 29 Jul 58, subj: WS-117L Development Plan.

Mr. Johnson also informed the Secretary of the Air Force that he had informally requested BMD to expedite "submission of a new development~~s~~ and funding plan in the amount of $215 million together with an assessment of those elements of the program that could be conducted on a more optimum basis if additional funds were made available, and the amount required therefor.[x]

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[x] Ibid.

ARPA had made available only $30.7M at that by increasing fund availability in the amount of $8.0M on 17 July 1958 by Amendment No. 1 to ARPA Order No. 9-58, from a former amount of $22.7M made available in ARPA Order No. 9-58, 30 June 1958. The increase in fund availability was for the purchase of four WS 117L upper stages.[x] ARPA had made no funds available for public works.

AFBMD revised the Advanced Reconnaissance Satellite Development Plan and agreed on scheduled presentations of the revised WS 117L development plan to the Vice Chief of Staff, Deputy Chiefs of Staff and selected air staff members at 1000 hours on 24 September 1958; to the Air Force Ballistic Missile Committee Meeting at 1400 hours the same day, and to ARPA at 1000 hours on 25 September 1958.[x]

The plan provided for over-all system development of twelve subsystems much the same as described in 2 April 1957 development plan, except subsystem "L" had been added. The subsystems were as follows:

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[x] Msg, OSD ARPA, DEF 944944, 17 Jul 58.

[x] ~~Msg-AFCGM-57155~~ AF Msg, AFCGM 57155, 12 Sep 58.

A. Airframe
B. Propulsion
C. Auxiliary Power
D. Guidance and Control
E. Visual Reconnaissance
F. Ferret Reconnaissance
G. Infrared Reconnaissance
H. Ground-Space Communication
I. Data Processing
J. Geophysical Environment
K. Qualitative Personnel Requirements Information (QPRI)
L. Biomedical Recovery Capsule

The AFBMC convened during the period 1430 to 1630, 24 September 1958, to review the revised Development Plan based on FY 1959 funding requirement of $231.223M. AFBMD briefed the AFBMC by reviewing the WS 117L system, subsystems, and work area and in order to show reasons for the increased funding requirement reviewed the history of directed program funding and development plan revision. ARPA had directed addition of nine Thor boosters[x] to the ten previously programmed, and the absorption of a $7.9M bio-medical program within the $215M ARPA programmed funding ceiling. In addition $19M in contractor costs and $7.4M [redacted] costs payable by ARPA were identified. The contractor costs was the result of more "definitive cost estimates, primarily by subcontractors, at this stage of program development." The support costs was the result of utilization of a funding criteria guide ARPA furnished AFBMD.

Hon. Lyle S. Garlock, Assistant Secretary, (Financial Management) challenged the support cost on the grounds that the cost should be reviewed for absorption and funding by the Air Force. Among the items AFBMC noted, was the first Atlas boosted pioneer reconnaissance had slipped approximately one year; possibilities of accelerating attainment of an infrared attack alarm system (Subsystem "G."); and the need for a top level discussion with ARPA with a view toward:

(1) Clarification and definition of ARPA directed "work areas."

(2) Breakout of WS-117L operational and support costs to be funded by the Air Force, and

(3) Determination of point in time and/or development where Air Force will assume operational control of the WS-117L program.

The AFBMC approved the development plan in principle and directed the revised plan, less the Operational Annex, be presented for approval to the Director, ARPA, "with appropriate reservations as to Air Force review of funding of program operational and support costs."[x]

The Director of ARPA did not approve the development plan ~~and explained~~ for reasons as explained in AFBMD's briefing to ARPA on 25 September 1958.

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[x] Minutes of Twenty-fourth Meeting AFBMC, 20 Oct 58.

Johnson's reasons for not approving the development plan were that FY 1959 funding plan as presented exceeded the ceiling established by ARPA in the amount of $215.0M; the FY 1960 budget was in excess of what ARPA considered a realistic funding level, and achievement of major objectives in the program had been delayed, "in spite of the fact the proposed funding level for FY 1959 has been increased.[x]

At that point in time ARPA had issued Amendment No. 4 to ARPA Order No. 9-58 on 25 September 1958 increasing fund availability from $70.7M to $136.2M qualified with the statement that "the total funding had not been apportioned and the amount was not available." Amendment No. 2/ 4 August 1958, to ARPA Order No. 9-58 had increased fund availability to $50.7M from $30.7M specified in Amendment No. 1, and Amendment No. 3, 25 August 1958, to ARPA Order 9-58 had increased fund availability to $70.7M.

~~Immediately after~~ On the same day AFBMD ~~had~~ briefed ARPA on 25 September 1958 on the revised development plan, ARPA established an ARPA Ad Hoc Project GROUP for the "purpose of investigating, evaluating, and recommending an ARPA

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[x] ARPA Memorandum for the Commander, BMD, ARDC, 25 Sep 58, subj: ARPA Ad Hoc Group on Project Sentry and Follow-on Program.

Sentry and follow-on Program." The Ad Hoc Group members were Mr. Richard S. Cesaro, Chairman; Mr. Lambert L. Lind; Mr. Jack Irvine; and Captain Robert C. Trux, USN.[*]

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[*] Captain Trux had transferred to ARPA after three years duty in the AFBMD WS 117L program office, when ARPA assumed responsibility for the WS 117L program. According to a biographical Sketch of Commander Robert Collins Trux, and Who's Who, 1960, Commander Trux ~~was-a-graduate of-U.-S.-Naval-Academy-class-of-1939--~~ graduated from U. S. Naval Academy in 1939 with a B. S. degree in Mechanical Engineering. He received a B. S. degree in Aeronautical Engineering in 1952 and M. S. in Nuclear Engineering, Iowa State College in 1953. Comdr Trux received the Robert H. Goddard Memorial Award (ARS) for outstanding achievement in the field of liquid propellant rockets in 1951. He was Director, American Rocket Society, 1947-1950; Vice President, 1956 and President in 1957. Commander Trux was the author of technical reports and papers, some of which were pertinent to the satellite program; and as of 1 June 1957 held patents to two rocket devices and had four patents pending. Unpatented were a "number of ideas and techniques basic to certain rocket techniques, including hypergolic ignition, chemical pressurization, the main jet-driven turbo-pump, and the propellant gas generator." In a taped interview by Dr. Alfred Rockefeller, Jr., former AFBMD Historian, with Colonel Frederic C. E. Oder, Director for WS 117L, 17 January 1959, beginning with ARPA management of WS 117L program, there began "a big period of confusion" during which time AFBMD was"beaten back" time and time again. The Secretary of Defense had directed AFBMD accelerate the program and AFBMD had directed Lockheed to accelerate, but on the other hand

there was not enough money available (including money for facilities such as launching pads and readout station) for acceleration and there had been numerous changes in the program such as the addition of bio-medical program recovery that would support a Man-In-Space program . Commander Truax was not always in agreement with ~~decision~~ ARPA made decisions in regard to the program. ARPA made Commander Truax available for transfer but he retired in the spring of 1959 and went to work for Aerojet General Corporation, Liquid Rocket Plant, Sacramento, California, in 1959.

Mr. Johnson's plan was to send the Ad Hoc group to AFBMD on 29 September where the group were to remain as long as necessary for ARPA to "establish complete coordination with BMD on the technical objectives, launching schedules, and future cost levels of the program." Concurrently, Mr. Johnson planned to work with the Air Staff to "resolve any questions of support charges to you from other elements of the Air Force."[x]

Mr. Johnson directed that "Until I can take action on the group's recommendations, you should take immediately those measures necessary to limit FY 1959 obligations to the fund availability of $192 million ($215 million less $25 million reserved for construction)."[x]

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[x] *Ibid.* x Ibid x Ibid

After AFBMD had submitted the Sentry Development Plan dated 15 15 September 1958, to USAF for approval, AFBMD received a letter from APRA, in which letter Mr. Johnson again requested that the term "WS 117L" be abandoned (ARPA had continued using the term after Johnson's June request to abandon the term) and the name "SENTRY" be applied "only to those operational capabilities previously designated as Pioneer Visual (Program II) and Pioneer Ferret (Program III)" The letter started the beginning of a re-definition of the Advanced Reconnaissance System. ARPA directed that for budget purposes, all items "required to complete development of these systems will be budgeted not as systems, but as subsystems, and other items which cannot be identified with any specific component or subsystem will be budgeted separately."x

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x ARPA Memorandum for Commander, AFBMD, ARDC, Inglewood, Calif., 10 Sep 58, subj: Re-definition of WS-117L.

ARPA directed that common costs that could not be prorated between the Sentry project and advanced work, should be retained as part of Sentry. ARPA did not ask for a new development plan because the development plan requested on 29 July 1958 was essentially completed. However, ARPA requested that an addendum to the current development plan and "budget should be supplied at an early date, summarizing the adjustments in estimates necessary to place them on the new basis."[x]

On the same day AFBMD received ARPA's memorandum of 10 September 1958, pertaining to the re-definition of WS 117L, Mr. Lind and Mr. Gise of the ARPA staff phoned Colonel Richard D. Curtin, Deputy Commander, Military Space Systems,[*] AFBMD, demanding that the FY 60 Budget Estimate be submitted immediately in the manner prescribed by the 10 September Memorandum.

On 18 September, Colonel Evans phoned General Schriever who was in Washington, and made available to him a preliminary breakout of the FY 1960

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[x] Ibid.

[*] Effective 1 September 1958, Headquarters ARDC reorganized AFBMD to discontinue the Office of the Deputy Commander for Weapon Systems and to designate the Deputy Commander for Military Space Systems and Deputy Commander for Ballistic Missiles. Colonel R. D. Curtin became Deputy Commander for Military Space Systems. Colonel Harry L. Evans, Jr., became Director for the Directorate WS 117L and Colonel Frederick C. E. Oder became Deputy Director for WS 117L.

Budget Estimate, in the total amount of $296.676M. General Schriever discussed the 10 September Memorandum with Hon. Lyle S. Garlock, Assistant Secretary of the Air Force (Financial Management) because of the long term implications of the memorandum that did not have Air Force agreement, and gave Garlock the breakout of the FY 1960 Budget Estimate which did not include Subsystem "G" (Infrared). Mr. Gise confirmed to Colonel Oder on 25 September that Garlock had passed the information to ARPA.[x]

It was in that atmosphere of ARPA planned program changes that AFBMD had briefed Mr. Johnson on 25 September 1958 on the revised development plan and it was that day that Mr. Johnson appointed the Ad Hoc Group.

The Ad Hoc Group arrived at AFBMD on 30 September 1958 and on 2 October Mr.Davis Young (ARPA) joined the group. AFBMD members of the Directorate WS 117L briefed the members of the Ad Hoc Group on all subsystems of WS 117L and the breakout of funds allocated to each subsystems and facilities required for the WS 117L program. The briefing team pointed out that "it was our rough estimate, were one to assume that the SENTRY/THOR program had never existed that in order to reach the same timewise goals on the SENTRY/ATLAS program the FY 59 costs for the 117L program would have been in excess of $190 million."[x]

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[x] GO No. 57, ARDC 30 Sep 58; AFBMD (WDSPR) Memorandum for General Funk, General Large, Dr. Ramo, All Personnel, AFBMD, 12 Sep 58, subj: Announcement of AFBMD Internal Reorganization; AFBMD (WDSPR) Memorandum for General Funk, General Large, Dr. Ramo, All Personnel, AFBMD, 16 Sep 58, subj: Organizational Announcement, Organization of the Deputy Commander Military Space Systems, AFBMD; AFBMD (WDZW) Memorandum for the Record, Col Oder, Deputy Director for WS 117L, 15 Oct 58, subj: Review by ARPA Ad Hoc Committee of the 15 September 1958 WS 117L (SENTRY) Development Plan and Related Actions during the Period 30 September - 3 October.

~~On 2 October Mr. Cesaro, Chairman of the Group, questioned Mr. Jack Carter of Lockheed, over Lieutenant Colonel Battle's objections, as to the contractor's opinion of the general military objectives of the WS 117L program. Mr. Cesaro advised the contractor to perform certain studies "that would relate to important pending decisions at ARPA affecting the amount of support the program would receive." Mr Cesaro also informed the contractor that Subsystem "G" would not be supported as part of the Sentry program and advisd Mr. Carter to take his proposal directly to ARPA." In addition Mr. Cesaro revealed to Mr. Carter the amount of AFBMD's FY 1960 budget estimate although Colonel Battle had~~

add 1st name

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[x] Ibid.

~~informed Mr. Cesaro the contractor did not know the amount of the budget estimate and that the "WS 117L Project Office is about to enter negotiation with LMSD." Lieutenant Colonel Battle apparently considered the actions "have been prejudicial to effective management of the WS 117L program by AFBMD and extend beyond the authority and responsibility of the ARPA organization."~~[x]

~~[x] Ibid.; WDZW Memorandum for Colonel Oder, 3 Oct 58, subj: ARPA Ad Hoc Committee.~~

The Ad Hoc Group departed Air Force Ballistic Missile Division on 3 October 1958 and on 9 October General Schriever made a reply to Mr. Johnson's Memorandum of 10 September relative to the re-definition of WS 117L. General Schriever strongly recommended that "you reconsider the proposals you have made on re-defining WS 117L so that we may continue to vigorously pursue a system oriented program." General Schriever further replied that "I am convinced this will provide our country the earliest achievement of true surveillance capability in the Visual, the Ferret and the Infrared Reconnaissance area." General Schriever sent his reply to the Commander, Air Research and Development Command

and asked for the Commander's support of his position to include discussion with the Chief of Staff "as I view with concern the trend being shown by the ARPA in the WS-117L Program.[x]

The Director of Budget, USAF, supported General Schriever in his recommendation to ARPA and notified General Schriever of a scheduled meeting with ARPA to discuss the WS 117 program and that "further guidance as a result of this meeting" would be provided.[x]

On 24 October 1958, the Director of Budget, USAF, notified General Schriever that to "complete discussion and resolution of 117L program with ARPA Ad-Hoc Committee and AF Representatives, including proposed changes to Program on 29 October 1958" required the presence of Colonel Oder, Colonel Evans and Major Zalenka at the meeting to assist Air Force Representative, Mr. L. C. Meyer in "feasibility and contract requirements for proposed recision as well as details not readily available in development plan."[x] Under Secretary of Air Force, Malcolm A. Mac Intyre and Mr. Johnson desired a speedy resolution. On 17 November MacIntyre wrote of their agreements ~~to the Director of ARPA, in~~ in a Memorandum for the Director of ARPA. The Air Force and ARPA resolved their differences the Air Force Ballistic Missile Committee noted at their twenty-fourth meeting by agreeing on pricing and elimination of certain costs from ARPA funding. Altogether they had agreed on $30.9M as follows:[x]

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[x] WDZW letter sgd Gen Schriever to Mr. Roy Johnson, Director, ARPA, 9 Oct 58, no subject; WBZQ letter sgd Gen Schriever to Comdr ARDC, 16 Oct 58, subj: Re-definition of WS 117L.

[x] Msg, RDZGW-10-37-E, 23 Oct 58.

[x] Msg, AFABF 50054, 24 Oct 58.

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[x] Msg, AFABF 50054, 24 Oct 58.; Memorandum for the Director of ARPA fm Malcolm A. MacIntyre, Under Secretary, USAF, 17 Nov 58.

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a. $6.3M for guided missiles launch facility at Pacific Missile Range.

b. $1.1M for telemetry ship requirements.

c. $4.6M for one of three tracking stations that could be deferred to FY 1960.

d. $7.6M indirect support costs contributed by Commands other than ARDC and military construction planning funds.

e. $11.3M for 2 tracking centers to be funded by the Air Force as operational facilities as well as DOD facilities.

About another agreement, MacIntyre wrote that "It is our understanding that the Secretary of Defense and you approve of our assignment of this project to ARDC within the Air Force where it will remain for some years until final objectives are obtained, and it is our intention that the basic center established at or near Offutt AFB will be operated by ARDC." MacIntyre requested that the channel of communication be through Headquarters, USAF, "with instructions in relation thereto be given to the Deputy Chief of Staff,

The Offutt center
at SAC Hdqs
was for Operational
SAC wanted the
system 70 go operational
that was when the
HqAF transferred the
system to SAF

look for 1999th
data processing
squadron under
6594
adjustment to be
made here

Development, Hq, USAF, with copies to the Assistant Secretary of the Air Force, Research and Development." The reason for that request was because "collateral operational factors as well as part Air Force funding and support by various Air Force commands makes it impossible for management to be exercised by direct content solely with the Ballistic Missile Division of ARDC or Headquarters ARDC itself."[x]

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[x] Ibid.

On 11 December 1958, ARPA amended ARPA Order 9-58 to redirect the responsibility for its execution from the Commander, Air Research and Development Command, to the Secretary of the Air Force. ARPA Order 9-58, 30 June 1958, had made Commanding General, Ballistic Missile Division responsible for the continuation of program WS 117L on behalf of the Advanced Research Projects Agency and had amended the order (Amendment No. 5) on 29 September 1958 to redirect responsibility for the execution of ARPA Order No. 9-58 from Commander, AFBMD, to Commander, ARDC.

In the mean time ARPA was going ahead with its"re-definition of Sentry" plans. Mr. Johnson answered General Schriever's letter of 9 October on 20 October 1958. Mr. Johnson ~~gave-his-reason-for-General-Schriever's--~~ concern ~~as-being-that-he-had-failed-to-adequately-explain-~~ attributed General Schriever's concern ~~to-his~~ in regard to the re-definition to ~~his-is-~~ "my failure to adequately explain the motivation." Mr. Johnson explained that an "often-expressed conviction among certain high Defense Department and Bureau of the Budget officials that WS 117L is becoming excessively expensive." It was Mr. Johnson's opinion that the attitude stemmed from a lack of appreciation "of the extent of the follow-on being incorporated in the over-all program." ¶ Mr. Johnson further explained that "Some of the advanced work, specifically the advanced propulsion and infrared programs, have impact on other ARPA activities and might in whole or in part be administered differently." ARPA had initiated work ~~on~~ to develop an advanced upper stage for Atlas that was intended both for later reconnaissance payloads and also for other ARPA programs, that was not to be managed as part of the Sentry program but "will be closely coordinated with it to insure compatibility with SENTRY requirements."

In Mr. Johnson's opinion the economy of developing the "stage for multiple uses outweighed the simplicity of management that would result if each system were allowed to develop its own complete inventory of components."[x]

On 3 December 1958, ARPA announced a program had been inaugurated to develop:"~~a-number-of-systems-and-techniques-which-will-be-employed-in-the-operation-of-space-vehicles-~~

Single space

> ''' a number of systems and techniques which will be employed in the operation of space vehicles. This program, known as DISCOVERER, will, in accordance with the wishes of the Administration, include not only the THOR launchings previously associated with the WS 117L program, but will be continued to include similar projects that are not operationally oriented.
>
> The first such project consists of the THOR vehicles and associated costs previously carried as a part of the WS 117L program. Henceforth, the project will be known as DISCOVERER-THOR project and it will be necessary to establish the ident~~y~~ity of this project separate from the 117L program.

ARPA tentatively re-allocated FY 1959 funds so as to show approximately $108.0M allocable to Discoverer-Thor project and $107.0M allocable to the

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x ~~ARPA,-Mr.-Roy-Johnson,-Director,~~ ARPA ltr from Mr. Roy Johnson, Director, to General Schriever, 20 Oct 58, no subject.

x Ibid.

Sentry program. Also tentatively, ARPA allocated FY 1960 funds in the amount of $60.0M to Discoverer-Thor project and $100.0M to Sentry program. [x]

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[x] ARPA Memorandum for the Secretary of the Air Force Attn: The Under Secretary of the Air Force, 4 December 1958, subj: WS-117L Program.

Mr. Johnson also responded to MacIntyre's memorandum of 17 November 1958, by confirming agreements pertaining ~~agre~~ assignment by the Air Force of the operational responsibility for the "Sentry program to the ARDC for the next several years and until final objectives are obtained." and that the Center to be established "at or near Offutt Air Force Base at some future ~~tim~~ date," and any related centers "pertinent to the program, will be operated by ARDC." [x]

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[x] Ibid.

On 16 December 1958 ARPA issued ARPA Order No. 48-59, to Secretary of the AF directing that all activities associated with the Thor program theretofore included in ARPA Order No. 9-58 for the Sentry Program, be continued as "an independent project identified as the Discoverer-Thor Project."

ARPA Order No. 48-59 requested the Secretary of the Air Force submit a financial plan that would be the basis for determining the division of funds.

Discoverer/Thor was the result of ARPA's decision to redefine WS 117L and it was one of three projects Mr. Johnson separately identified for development instead of the overall WS 117L program structure. Mr. Johnson defined Project Discoverer as "an open-ended series of satellite launchings utilizing initially the Thor IRBM as a basic booster, intended to carry out certain vehicle tests, bio-medical flights, and recovery experiments."[X]

[X] ARPA Memorandum for the Secretary of the AF, 12 Feb 59, subj: Policy Relating to the Official Identification of Projects Discoverer, Sentry and MIDAS. all caps

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MIDAS

~~ARPA had issued ARPA Order No. 38-59 on 5 November 1958 which separated the Infrared Reconnaissance (Sub-System G) development, identified as the Missile Defense Alarm System (MIDAS), from the basic WS 117L program. Mr. Johnson separately identified and defined MIDAS as "the priority development of a satellite-based, infra-red sensing system designed to provide maximum warning of missile launchings or~~

Restart
mention as qualifier
LSMD in design study
see p 3
Board report

MIDAS

On 2 October 1958, at the request of the ARPA Ad Hoc Project Group that Johnson had appointed on 25 September 1958, Mr. Jack Carter of Lockheed Missile and Space Division appeared before the group. Mr. Richard S. Cesaro, the chairman of the group, although prejudicial to effective management of the WS 117L program by AFBMD, informed Mr. Carter that Subsystem G would not be supported as part of the Sentry program and advised Mr. Carter to take his proposal directly to ARPA.[x] On 8 October 1958, AFBMD informed ARDC to ARPA's apparent intent not to fund the Attack Alarm system development during Fiscal Year 1959[x] and on 23 October 1958 Headquarters USAF Director of Research and Development "directed that the Advanced Infra Red Technology development now being performed by BMD be continued. Appropriate funding action will be accomplished in near future."[x]

On 5 November 1958, Advanced Research and Development Agency issued ARPA Order No. 38-59 which separated the ~~INFRARED R~~econnaissance (Subsystem G) from the basic WS 117L program. Mr. Johnson separately identified and defined MIDAS as "the priority development of a satellite-based, infra-red sensing system designed to provide maximum warning of missile launchings or other strategic attacks against the United States.[x] The first MIDAS Development Plan, 30 January 1959, identified the subsystems used by MIDAS as follows:

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[x] WDZW Memorandum for Colonel Oder, 3 Oct 58, subj: ARPA Ad Hoc Committee.

[x] Rockefeller Chronology, 27 Sep 59.

[x] Msg, RDZGW-10-40-E, 23 Oct 58.

Subsystem A - Airframe
Subsystem B - Propulsion
Subsystem C - Auxiliary Power
Subsystem D - Guidance and Control
Subsystem G - Infrared Reconnaissance
Subsystem H - Ground-Space Communications

The primary role of the infrared subsystem was to provide a positive alarm of an attack on the United States from the Soviet Union. Initially, the system was designed to monitor aircraft and rocket missiles but emphasis was shifted to detect ICBM launchings from Soviet territory. The specific information required was the detection of launchings, the rate of launchings, and the direction of flight. Lockheed released a revised Engineering Analysis Report[*] for MIDAS on 19 May 1958 that presented the feasibility and technical basis for a satelliteborne attack alarm system. The revised report included a proposed improvement of a propellant change to Unsymmetrical Dimethyl Hydrazine (UDMH) and Inhibited

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[x] *Ibid.*

[*] WS-117L, *Subsystem G, Engineering Analysis Report, Attack Alarm System* LMSD-2939, 19 May 58.

Red Fuming Nitric Acid (IRFNA) that would allow an increase in satellite payload weight.[x] Figure ______ shows an artist's conception of a Satellite Infrared Detection and Surveillance System Installation and Figure _____ shows a MIDAS satellite configuration.

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[x] LMSD Program 461 Historical Monograph, 15 Jun 65.

Figure ______

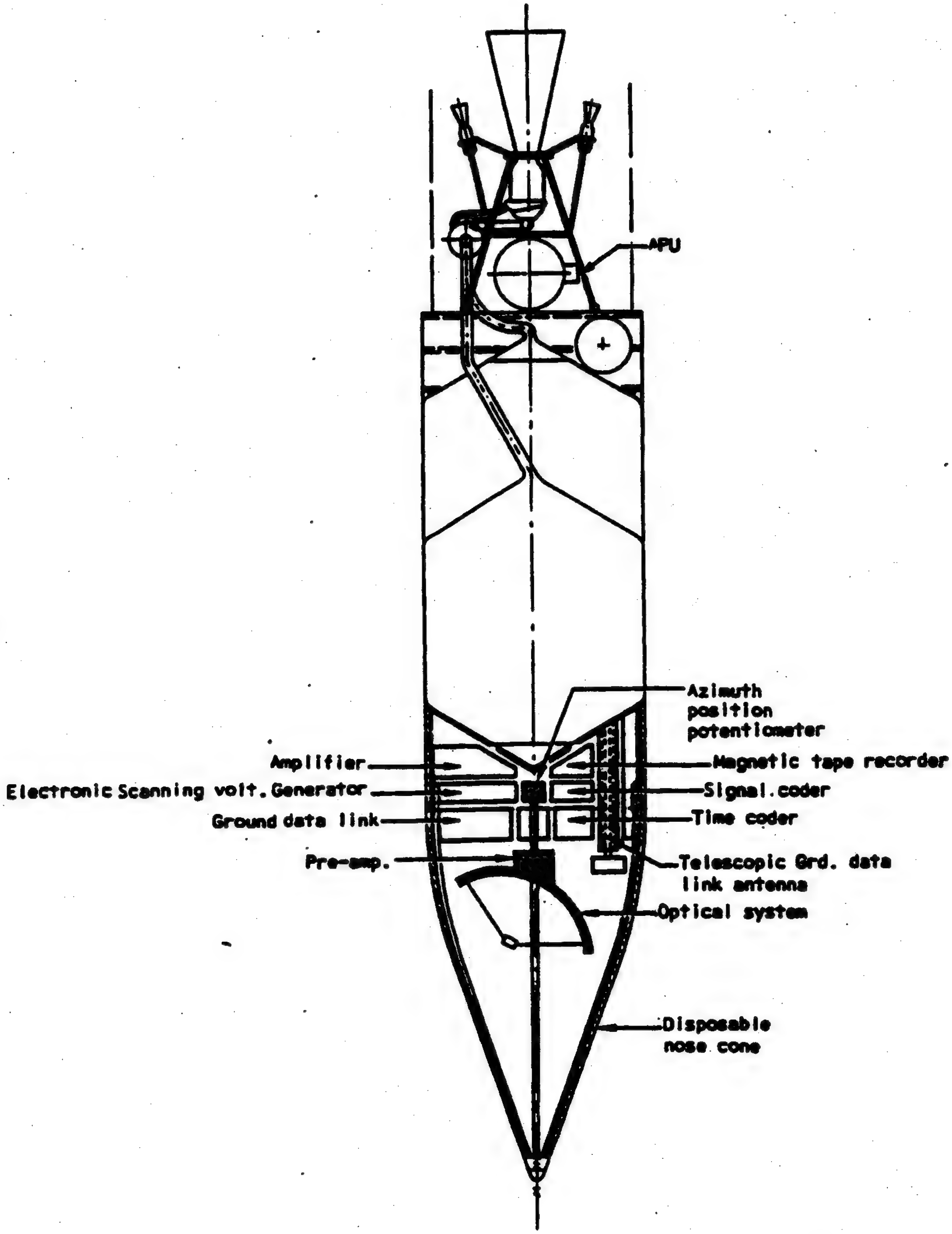
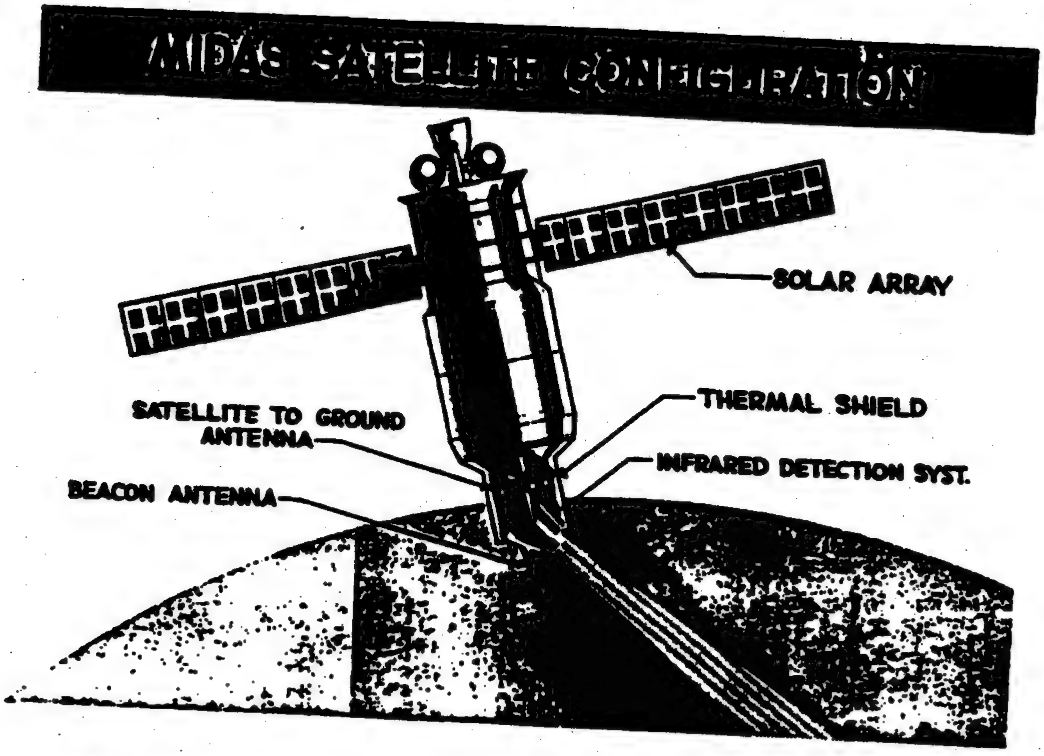


Figure ____ Satellite Infrared Detection and Surveillance System Installation, contained in the Lockheed WS 117L Advanced Reconnaissance System Development Plan 1 November 1956 (MSD 2011)



The satellite configuration for the MIDAS system is basically the same as that employed by Discoverer and Sentry. The principal differences are the solar array and the infrared scanner of the MIDAS system. The solar array will be about 80 square feet in area, extendable when the vehicle reaches its orbital position, and oriented in order to provide maximum power. Orbital jets will provide the control of the vehicle period in order that it will maintain its position in the satellite configuration. The cutaway in the nose section shows the infrared detection system in one instantaneous position as it revolves about the yaw axis of the vehicle. The thermal shield provides a uniform temperature for the scanning equipment, maintaining that temperature to ±5 degrees. The data link-to-ground is a 100 kilocycle bandwidth VHF system for Phase I of the program, and a 100 kilocycle UHF system for the Phase II program.

Figure ________ MIDAS Satellite Configuration and description shown in LMSD MIDAS Presentation 12 August 1959 (LMSD-445610).

The Development Plan for the MIDAS Program prepared and submitted in accordance with ARPA Order No. 38-59 and USAF General Operational Requirement 80-3 (Revised 26 September 1958) provided for 20 satellites placed on polar orbits at an altitude of about 1000 nautical miles to detect the infrared radiation emanating from ICBM's launched in the USSR and instantaneously report by way of a telemetering link to at least one of three readout stations situated in the general vicinity of the Ballistic Missile Early-Warning System (BMEWS)* sites. The proposed three stations were located at Fairbanks, Alaska, [redacted] [redacted] Figure No. ______ illustrates how a MIDAS vehicle could performs.

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* Headquarters USAF assigned BMEWS management responsibility to AFBMD in November 1957. The Joint Source Selection Board met 18-22 December 1957 to evaluate contractor proposals and later recommended Radio Corporation of America as BMEWS prime contractor. By agreements reached between Vice Chief of Staff, USAF, and the ARDC and AMC Commanders, management responsibility for BMEWS was transferred to New York Joint Project Office, New York City, on 12 February 1958. A short history of BMEWS, together with supporting documents may be found in Appendix No. ______.

[redacted]

x MIDAS Directorate (SSZM) Historical Report, 30 Jul 62; Military Satellite Program Progress Report for Quarter Ending 31 Aug 61, p 36.

Subsystem-I

Contractual coverage!

, Rome Air Development Center (RADC) had been responsible for the Intelligence Parameters Task and for the Intelligence Data Handling Task under the old Project 1115,[x] and was responsible under Obligations

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[x] LtCol Frederic C. E. Oder Memorandum for Col Terhune, 27 Sep 56, subj: Report of Trip 18-21 Sep 56.

Authority 57-17, 25 January 1957, was authorized to continue effort in the Data Processing and Dissemination area for WS 117L.[x] Under Obligations

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[x] Management Report, ARS, 31 Jan 57.

Authority 58-25 ~~was-responsible~~ RADC was responsible for conduct of "a program of research and development on equipments, techniques and methods for processing of photographic, Ferret, and Infrared, data returned from the satellite, into meaningful intelligence."[x]

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[x] ARS Development Plan, New Horizon Program, 15 Mar 58.; BMC (MCPTA) Weekly Diary 13 Feb 58.

The Source Selection Board met at Rome Air Development Center 6-8 November 1957 and 7-10 January 1958 to select a Prime Contractor for Data Processing. The board members considered Ramo-Wooldridge Corporation, Radio Corporation of America, International Business Machines Corporation and Eastman Kodak, and unanimously selected Ramo-Wooldridge Corporation as best qualified.[x] However, Headquarters USAF delayed award of the contract until a determination was made that Ramo-Wooldridge Corporation was not in a special or preferred position with respect to the WS-117L Program.[x]

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[x] WDTR Memorandum to General Schriever, 15 Jan 58, subj: Selection of Prime Contractor for Data Processing Subsystem, WS 117L.

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[x] BMC (MCPTA) Weekly Diary 27 Feb 58; WDTR Memorandum To General Schriever, 3 Feb 58, subj: Status of Prime Contractor Selection for WS 117L Data Processing Subsystem; WDT Memorandum to Col Oder, 4 Feb 58, subj: R-W Participation in WS 117L; WDTR Memorandum for Colonel Terhune, 14 Feb 58, subj: R-W Participation in WS 117L.

RADC awarded Contract No. 30(602)-1814 to Ramo-Wooldridge Corporation in May 1958 for design and implementation of the Intelligence data handling system, Subsystem I.[x] Ramo-Wooldridge Corporation in turn negotiated subcontracts as follows:

a. Itek Corporation for the major optical assemblies and devices.

b. Broadview Research Corporation for photo interpretation keys and equipment requirements.

c. Systems Laboratories Corporation for geodetic calculations and applications.

d. Planning Research Corporation for application of ~~their~~-intelligence parameter work.[x]

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[x] WS 117L Program Status Report as of 15 May 58

[x] *Ibid.*

Ramo-Wooldridge and Lockheed immediately achieved a mutually agreeable working relationship to insure the coordination of effort and timely and orderly exchange of information required for the most expeditious development of the total system.[x]

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[x] *Ibid.*

+ [illegible] (ISPH TW; 36 [illegible] 59 (Superseded by [illegible] ARDC)

Ramo-Wooldridge Corporation's facility for Data Processing was established in ~~the Ramo-Wooldridge facility in~~ Denver, Colorado, where representatives from Air Force Ballistic Missile Division, Rome Air Development Command, Air Research and Development Command, Ballistic Missiles ~~Ctr~~ Center and Headquarters USAF attended a formal Development Engineering Inspection on 18 March 1959. There was an initial "display of the data processing concept wherein data is processed from receipt of information through data link communications through master processing and converters through photo interpretation to final indexing. Principal contractors involved were Ramo-Wooldridge Corporation and Itek Corporation."[x]

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x BMC (IBJ) Weekly Diary 26 Mar 59.

(✓) Effective 1 July 1959 ~~On 17 June 1959,~~ ARDC ~~was~~ designated and organized under ARDC Unit Manning Documents, the 6594th Data Processing Squadron, Lowry Air Force Base, Denver, Colorado.[x] ~~On~~ Effective 1 October 1959, the squadron was redesignated the 4999th Data Processing Squadron without change in parent organization.

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x GO No. 54 ARDC 17 Jun 59.

(5 of 3) ~~The [illegible] was~~ mission of the Squadron was to achieve capability to operate and ~~maintain~~ SAMOS & (acquisition, data processing, and data reduction in accordance with approved operational program schedules.

~~GOR No. 80, 16 March 1955,~~ General Operational Requirement for a Strategic Reconnaissance Satellite Weapon System No. 80, 16 Mar 55, provided for operational employment of the satellite, with a means of storing intelligence data until the vehicle [illegible] is? ~~is~~ within secure communication range of monitoring sites and the capability for alternate payload substitution prior to launching. Such capabilities required/ground based monitoring sites ~~sties~~ to receive collected data from the satellite.~~so designed~~ ~~The sites~~It was necessary to design and locate the facilities so as to minimize enemy interception of or interference with the transfer of collected intelligence information to the [illegible].ground site. The system required continuous initial data handling for processing images and electronic intercepts into indications and intelligence at the same rate as received,and ~~the~~ equipped ~~capability~~ so as to be capable ~~to~~ of transmitting intelligence date pertaining to high priority targets and weather information directly to the using agencies..

In addition to GOR No. 80, AFBMD was developing WS 117L under ARDC System Requirement No. 5, while ARDC Detachment #1, Wright-Patterson AFB, Ohio, was developing WS 438L, USAF Intelligence Data Handling System, under ARDC systems requirement #13, that made it possible that a considerable potential overlap exist in the implementation of the two ARDC System Requirements, insofar as Subsystem I was concerned.[x]

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[x] Ltr, WDTR to MajGen H. M. Estes, Jr., Asst DC/Weapon System Detach #1, Hq ARDC, Wright-Patterson AFB, 26 Apr 57, subj: Coordination of WS-117L and WS 438L Intelligence Data Handling Function.

x History of 6594th TW (Satellite) (ARDC) date Appendix No. 6 p 6.; Atlas Program Flight History, Revision K p 4-68

FOOTNOTES

✓1. Ltr, (TSEON) BrigGen Alden R. Crawford, Chief, Engineering Division to COAF, USAF, Subj: Project RAND, Satellite Vehicle, 8 Dec 57.

✓2. Ltr, MajGen Crawford to Douglas Aircraft Co., Inc., Attn: Mr. F. R. Collbohm, subj: Satellite Project, 17 Feb 48.

(3) ARDC Project Development Directive No. 1115, 14 Sep 54; Historical Report Weapon System 117L, 1 Jan-31 Dec 56, prepared by Alfred Rockefeller, Jr., Historian Western Development Division (ARDC), 15 Apr 57.

(4) Historical Report WS 117L by Rockefeller

(5) Ibid.

(6) Ibid

7. DF from WCSG to WCIPP, 14 Dec 54, subj: Project Nickname, Comment No. 1 14 Dec 54 date and Comment No. 2 dated 17 Dec 54; Project 1115 Background 31 Dec 54. ~~[illegible]~~ ~~Project 1115 Background [illegible]~~

8. Memorandum, General Thomas D. White to Deputy Chiefs of Staff, 14 May 54, subj: Project ATLAS.

✓9. Personnel Assignment Memorandum No. 8, Hq USAF, 27 May 54; ✓SO 142 DAF, ✓23 Jul 54.

10. Memorandum to Colonel Sheppard from Colonel Charles H. Terhune, Jr., 3 Nov 54, subj: Proposed Visit of Majors Green and Riepe, WADC Project Officers for 1500-Mile Tactical Missile and Satellite, Respectively, to WDD.

An essay submitted to the Robert H Goddard Historical Essay competition by

11. Memorandum for General Schriever from Colonel Harold W. Norton, 8 Jul 55, subj: Satellite Presentation.

12. WDTD Memorandum for General Schirever, 7 Oct 55, Subj; Satellites; An Essay submitted to The Robert H. Goddard Historical Essay Competition by R. Cargill Hall, October, 1963, p 21

Same as 12

✓ ✓13. Memorandum for General Schriever from Colonel Harold W. Norton, 7 Oct 55, subj: Satellites.

✓ ✓ 14. Ltr, WDS, LtCol John B. Hudson to Distribution, 10 Feb 56, subj: Reorganization and Religmment of Functions of Technical Operations (WDT).

(15.) Report of Contractor Evaluation Board, WS 117L, 20 Mar 56.

✓16. Msg, RDGE-5-23-E, 22 May 56.

✓17. Memorandum for Colonel Terhune from R. C. Truax, Commander, USN, Assistant Deputy for WS 117L, Technical Operations, 12 June 1956, subj: Status of WS 117L Program as of 12 Jun 56.

✓18. USAF Development Directive Number 85, 3 Aug 56.

✓19. Ibid.; AMCR 11-14, Work Priorities for USAF Logistical Support Tasks, 6 Apr 54.

✓20. Ltr, Colonel Charles H. Terhune, Jr., Thru Commander ARDC to Deputy Chief of Staff, Development, Headquarters, USAF, 28 Aug 56; Requirement for Additional FY 1957 Funds for WS 117L; ✓Msg, RDZGW-10-3-E, 11 Oct 56; ✓ Msg, AFDRD Cite 57697, 22 Oct 56.

✓21. Ltr, WDTR, Terhune, to Director of Research and Development, Hq USAF, 21 Nov 56, subj: Fund Requirements for Weapon System 117L Program; w/1st Ind, ARDC (RDZGW), 26 Nov 56, same subject.

✓22. Ltr, DAF, to Comdr ARDC, 10 Dec 56, subj: (Encl) Requirement for Additional FY 1957 Funds for WS 117L.

✓23. Summary of the Advance Reconnaissance System Development, p3 (Inclosure 2 to DF(9 May 57) from Maj Dillon /Maj F. K. Dillon, Hq USAF, DCS/D/

~~26.~~

24. Ibid.

25. Msg, AFDRD-SS 47017, 1 Feb 57; Msg WDTR 2-2-E, 9 Feb 57.

26. Ltr, LtGen D. L. Putt, to Comdr ARDC, 6 ~~Jan~~ mar 57, subj: Planning and Funding Requirements for WS 117L, w/1st ind, ARDC (RDZGW) 13 mar 57

27. Personnel Actions Memorandum (PAM) No. 28, WDD, 7 Sep 56.

28. PAM No. 16, WDD, 5 Jul 56.

29. Pam No. 21, WDD, 16 Aug 56.

30. PAM No. 40, WDD, 2 Nov 56.

31. PAM No. 48, WDD, 19 Dec 56.

32. [redacted] ~~PAM~~ PERAM No 34 AFBMD ~~WDD~~ 25 June 57

33. ARS Development Plan, WDD, 15 Mar 58 as amended to 1 Jul 58; DF, MCPTA (BMO) 18 Jul 57, subj: Weekly Diary, 12 Jul Thru 18 Jul 57.

34. Revised DP dated 2 Apr 57.

36. Statement submitted by Major General Bernard A. Schriever, Commander, Air Force Ballistic Missile Division, Hearings of the Senate Subcommittee on Preparedness Investigating 17 December 1957.

~~36~~ 35. GO No. 19, ARDC 21 May 57.

37. Memorandum for General LeMay 10 Oct 57 from James Douglas, Secretary of the Air Force, subj: WS 117L.

38. Msg AFDRD-SS 51476, 15 Oct 57.

39. Msg, AFMPP 51689, 18 Oct 57.

DAF

40. /Memorandum for Chairman, Scientific Advisory Board, 15 May 57, subj: SAB Special Study of Advanced Weapon Technology and Environment

41. Ltr, LtGen Putt to LtGen S. E. Anderson, Comdr ARDC, 17 Oct 57, no subj; Memorandum for the Record, Colonel Frederic C. E. Oder, 25 Oct 57.

42. Memo for Col Terhune from Col Oder, 31 Oct 57, subj: Informal Reaction of the "Stewart" Committee on Special Capabilities to the 18 October Presentation on WS 117L.

✓41. Scientific Advisory Board Ad Hoc Committee on Advanced Weapons Technology and Environment, 9 Oct 57.

42. Ltr, LtGen Putt to LtGen S. E. Anderson, Comdr ARDC, 17 Oct 57, no subj; ✓Memorandum for the Record, Colonel Frederic C. E. Oder, 25 Oct 57.

✓43. Memo for Col Terhune from Col Oder, 31 Oct 57, subj: Informal Reaction of the "Stewart" Committee on Special Capabilities to the 18 October Presentation on WS 117L

44. Ibid. 45 + 46 - all pages 32 + 326

US Government organization manual p 134 get date

47 ~~45~~. Memorandum for Secretary of Defense from Richard E. Horner, Asst Secy of Air Force (R&D), 12 Nov 57, subj: Outer Space

48 ~~46~~. Msg, 11-033, Comdr ARDC to Comdr AFBMD, 13 Nov 57; Msg, WDZCP-12-4-E, 4 Dec 57; Msg, 02-022, Comdr to Comdr AFBMD, 14 Feb 58; [illegible] 1960.

49 ~~47~~. ARS Development Plan, 1 Jul 58, p I-2-1

50 ~~48~~. Msg, AFMPP 52392, 5 Nov 57.

51 ~~49~~. Introduction to WS 117L Development Plan for Program Acceleration (LMSD-2832), prepared by Missile Systems Division, Lockheed Aircraft Corp, 6 Jan 58, Para 4.7.

52 ~~50~~. Foreword, WS 117L Development Plan for Program Acceleration, Lockheed Aircraft Corporation.

53 ~~51~~. Ltr, WDTR, Schriever to Mr. L. Eugene Root, Vice Pres and General Mgr Lockheed Aircraft Corporation, Missile Systems Division, 23 Dec 57, no subj.

54 ~~52~~. Ltr, AFDRD-SS, BrigGen H. A. Boushey to Comdr, ARDC, 27 Nov 57, subj: Approval of Development Plan for WS 117L.

55 ~~53~~. Press Release No. 57-13, 4 Nov 57

56 ~~54~~. Hearings before the Preparedness Investigating Subcommittee on the Committee on Armed Services United States Senate Eighty-fifth Congress, p 1854, Part 2.

55

~~55~~. News Release No. 58-5, Project Able Fact Sheet.

57 ~~56~~. WDD (WDTIA) Memorandum for the Record, LtCol Sidney Greene, 22 Nov 57, subj: Study of THOR for Space Flight Testing.

58 ~~57~~. Memorandum for Colonel Terhune from Col Edward N. Hall, Director, Weapon System 315A, 14 May 57, subj: Vanguard, with 2 Incls: 1. Copy Memo for General Schriever from LtCol Emmett J. Kelly, WDD liaison Officer, ABMA, Huntsville, Ala, 19 Apr 57, subj: Satellite Study; 2. Ltr, Ramo-Wooldridge to Col E. N. Hall, 3 May 57, subj: Transmitting copy of GM67.3-49, with 1 Incl, Study, Proposed Use of IRBM as Booster for Multi-Stage Vehicle, 1 Apr 57; Ltr, Ramo-Wooldridge, L. G. Ludwig to L. G. Dunn, 18 ~~31~~ Dec 57, subj: Contractor Organization for Project Able.

59 ~~58~~. WDD (WDT) Memorandum for Generals Schriever and Ritland, 6 Jan 58, subj: Re-entry Test Program.

60 ~~59~~. WDD (WDTI) Memorandum for Col Terhune fr LtCol Richard K. Jacobson, 21 Jan 58, subj: Assignment of Project Able; News Release 58-5, Project Able Fact Sheet. 2nd 55

61 ~~60~~. Msg, SAFIS-3C 47151, 29 Apr 58.

62 ~~61~~. Thor Flight Summary - Flight Test No. 14, 23 ~~24~~ Apr 58.

63 ~~62~~. Thor Flight Summary - Flight Test No. 17, 9 Jul 58; Thor Flight Summary - Flight Test No. 19, 23 Jul 58.

64 ~~63~~. DOD Directive No. 5105.15, 7 Feb 58, subj: Department of Defense Advanced Research Projects Agency; Dod News Release No. 288-58 (for release 27 Mar 58) subj: Secretary McElroy Announces New Spage Programs.

65 ~~64~~. Hearings before the Preparedness Investigating Subcommittee on the Committee on Armed Services. United States Senate, 85th Congress [illegible]

66 ✓~~65~~. 1958 NASA/USAF Space Probes (Able 1) Final Report prepared for AFBMD by Space Technology Laboratories, Inc., 18 Feb 59; Memorandum for The Secretary of Defense, 24 Mar 58, from Dwight Eisenhower.

67 ✓~~66~~. Msg, DEF 363129 from OSD ARPA, 27 Aug 58.

68 ✓~~67~~. WDD (WDGE) Memorandum for General Schriever and General Ritland, 2 Oct 58, subj: NASA Representation at Coming Lunar Shot; NASA Ltr to Gen Samuel E. Anderson, Comdr, ARDC, subj: Continuation of Lunar Probe Projects, with Incl: NASA Request No. HS-2, 9 Oct 58, subj: Continuation of Work Begun Under ARPA Order No. 2-58; Report of the Select Committee on Astronautics and Space Exploration, 85th Congress, 2d Session; ✓ Msg, RDZCW-10-34, 24 Oct 58.

69 ~~68~~. STL Space Log, Vol[illegible], No. 1, 1 Jul 60; History of Project Score prepared by Dr. Frederick B. Heath, AFBMD Historian, 15 Jul 59.

70 ✓~~69~~. stet ~~WDD (WDGS) Memorandum for General Schriever, 1 Apr 58, subj: Message from SAPIS~~

~~Ltr DOD Armed Forces Policy Council (advice of action) to members of Armed Forces Policy Council 19 Mar 58 subj: Publicity on ARPA Projects and new Missile~~

DEPARTMENT OF THE AIR FORCE
SAMOS PROJECT OFFICE
Air Force Unit Post Office, Los Angeles 45, California

REPLY TO
ATTN OF: SAFSP-X/LtCol Phelps/3575

SUBJECT: Security Guidance of An Unclassified Nature Relating to SAMOS

TO: All SAFSP and LEX Personnel

1. There has been some misunderstanding as to the general classification of SAMOS information. To alleviate some of the misconceptions, I have attached to this memorandum the SAMOS Fact Sheet that is used in Public Affairs Plan for SAMOS Satellites.

2. The only unclassified information available on the purpose of SAMOS is:

"The SAMOS Project is a Research and Development Program to determine the capabilities for making observations of space, the atmosphere and the globe from a satellite."

This definition of the purpose of SAMOS will be used for all unclassified discussions; and will also be used, wherever possible, in classified briefings.

Harry L. Evans
HARRY L. EVANS
Colonel, USAF
Vice Director
SAMOS Project

SAMOS II FACT SHEET

I. GENERAL INFORMATION

Project SAMOS is a research and development program to determine the capabilities for making observations of space, the atmosphere and the nature of the globe from satellites. The program is under the executive management of the Secretary of the Air Force.

II. TEST OBJECTIVE

SAMOS II was launched into the Pacific Missile Range from an Air Force launch pad at the Naval Missile Facility, Point Arguello, California, to place the vehicle in a near circular polar orbit. The purpose of the research and development SAMOS flights is component testing bearing on the engineering feasibility of obtaining an observation capability from an orbiting satellite.

III. CONFIGURATION

SAMOS employs the AGENA as its second stage. It is boosted out of the atmosphere by a modified Air Force ATLAS, and placed into orbit by the AGENA.

First Stage

Booster: An Air Force ATLAS modified for the SAMOS II.

Height: Approximately 77 feet. (With adapter section).

Launch Weight: Approximately 262,000 pounds.

Propulsion: Rocketdyne liquid propellant engines, 356,000 pounds thrust.

Guidance and Control: The ATLAS booster is equipped with the GE/Burroughs radio command guidance system. The guidance system can detect position and rate, compare this information with the predetermined projectory data and command flight correction.

Satellite Vehicle

The entire Lockheed AGENA second stage becomes the orbiting satellite vehicle.

Height: About 22 feet.

Weight: Approximately 11,000 pounds at launch. Orbital weight after fuel exhaustion will be approximately 4,100 pounds.

Propulsion: Following coast period after ATLAS Burnout, a Bell liquid fuel rocket engine, developing 15,000 pounds of thrust, will propel the second stage into orbit.

Instrument Package: Test photographic and related equipment.

IV. TRACKING, TELEMETRY AND COMMAND

a. Primary tracking, telemetry and command during orbit will be performed by:

Vandenberg Tracking Station, Vandenberg AFB, California
Hawaiian Tracking Station, Kaena, Oahu, Hawaii
Kodiak Tracking Station, Kodiak, Alaska

b. Ascent Guidance (booster)

GE MOD II, Vandenberg AFB, California

c. Ascent Tracking and Telemetry

Vandenberg Tracking Station, Vandenberg, California

d. Downrange Telemetry and Tracking Ship

Pvt. Joe E. Mann

e. Ascent Radar and/or Optical Tracking (PMR)

Point Arguello, California

Point Mugu, California

St. Nicholas Island, California

f. USAF Satellite Test Center, Sunnyvale, California

(Control Center receiving all orbital data and exercising command control of SAMOS)

~~ARDC System Requirement No. 13 was ARDC's authority for development of WS 438L.~~ Although ~~ARDC Detachment NO. 1 was the~~ management responsibility of WS 438L, a world-wide intelligence data handling system was assigned to ARDC Detachment #1, Wright-Patterson AFB, through default the responsibility was carried by the Intelligence Laboratory at Rome Air Development Center, and the ARDC Directorate of Systems Plans. In February and March 1957, AFBMD considered the management of System 438L but the system was very complicated with "a number of bits and pieces ~~pu~~ plus plans and commitments in many areas such as Strategic Air Command and USAF Europe (USAFE). Besides AFBMD ~~was-developing~~ was developing Data Processing, ~~Subsystem--I,~~ ~~WS-117L~~ (Subsystem I), as an integral part of WS 117L, and a subcontractor or an associate prime contractor was to be considered in the near future.[x]

~~About-the-same-time,-AFBMD-became-involved---~~

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[x] Memo for Col Terhune from Col Frederic C. E. Oder, 8 Mar 57, subj: Proposal for WDD Management of 438L with atch 3, DF, WDTR to WDT, WDG (In Turn), 20 Feb 57, subj: Intelligence Data Handling System Support for WS-117L.

~~Handling Fun~~ction.

~~Beginning-i-~~ About the same time, AFBMD ~~was-concerned-in-the preparatio--~~ became involved in the preparation of the Preliminary Operational Concept for WS 117L. Representatives of Headquarters USAF met with Major ~~Wiembe---~~ H. F. Wienberg , WS 117L Program Office, 11-14 May during which time the representatives devoted a major "portion of the period toward gaining an understan/ing of the system, i. e. description, status, capabilities, problems and the implications ~~this~~ the system may have on USAF intelligence collection operations and data handling procedures." ~~Progra-The-group-Among-recommended-Recommendations-~~ ~~--Two-~~ ~~made-to-the-group/------responsible-for preparing-the-"Organization-organization/-section of-the-Preliminary Operational-Concept~~Major Weinberg recommended that the group responsible for preparing the organization section of the Preliminary Operational Concept seriously consider two major points: (1) The WS 117L ~~will~~ would be a new addition to the USAF Intelligence Collection System and as such would "require support facilities for the initial launching of the satellite and the continuous tracking, command, and readout functions to be performed. . . . This new organization (group or wing level size) should be assigned directly to or be directly controlled by Directorate of Intelligence, Hq USAF...."

" To attain the earliest possible operational capability (2)/the system should be run on a combined operational-development basis during the development phase beginning with the first high latitude shot and continuing until the GOR specifications of a surveillance capability."[x]

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x ~~Memo-for-Colonel-Terhune-~~ WDTR Memorandum for Colonel Terhune, 23 May 57, subj: Preparation of Preliminary Operational Concept for WS 117L.

By 25 June Personnel of the WS 117L Program Office had prepared a draft of the WS 117L Preliminary Operational Concept, with the exception of Section II, entitled "Organization," which was prepared by the Reconnaissance Branch, Operations Control Division, Directorate of Operations, DCS/O, Hq USAF, a copy of which ~~was-handcarried--to-AFBMD--Major-Was-hand-carried-to-AFBMD-by-Major-R.-Brown-~~ Major R. Brown of that office, hand-carried to AFBMD, during a visit on 4 June 1957. Major Brown reported that the draft section ~~was~~ had been informally co-ordinated with Brigadier General James H. Walsh, Deputy Director of Intelligence, USAF, and Major General K. P. Berquist, Dirctor of Operations, USAF. ~~MajGen~~ BrigGen Walsh and MajGen Berquist and their staffs favorably endorsed the eventual assignment of WS 117L to Strategic Air Command and the immediate assignment of an Initial operating capability to ARDC.[x] ¶ Headquarters USAF informed the Strategic Air Command of the informal action on 2 January 1958. The draft USAF Deputy Chief of Staff for Operations

x Col Frederic C E Oder memo to Col Terhune, WDT 25 June 57 subj: WS 117L Preliminary Operational Concept made distribution of its draft Headquarters USAF Preliminary Operational Concept dated 23 December 1957, and requested that the draft be used as the basis for preparing a Preliminary Operational Plan.[x] During January and February 1958, Strategic Air Command, AFBMD and Ballistic Missiles Division participated in the preparation of the Preliminary Operational Plan for WS 117L. Colonel Charles H. Terhune, in behalf of AFBMD, pointed out "critical problems that could arise from establishing early dates for SAC participation in the WS 117L Program. He stressed the point that SAC functions should be, in general, a 'phase-in' 'phase-out' type of operation in lieu of a sharp cut-off of R&D responsibilities." The logistic support involving procurement, supply and maintenance was generally patterned around a Weapon System Manager type of operation.

The review was followed by a full scale presentation to the staff of Command in Chief, SAC, in Omaha on 4 and 5 February 1958. AFBMD and Ballistic Missiles Office project personnel participated in further detailing and shredding out the functions in accordance with SAC's mode of operation. Key points of the plan were the establishment of a

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[x] Development Plan, ARS (WS 117L), AFBMD, 1 Jul 58; History of SAC Historical Study no 73, 1 Jan ~~58~~ - 30 Jun 58

WS 117L Wing directly under Cooke AFB operation, and an Airborne Intelligence Service Center physically located at Omaha to handle acquisitioning and processing of technical intelligence data.[x]

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[x] BMO (MCPTA) DF to MCPT, 6 Feb 58, subj: Weekly Diary, 31 Jan thru 6 Feb 58.

The Ballistic Missiles Office Weapon Systems Project Officer received the Strategic Air Command's Preliminary Operations plan on 19 March 1958 for final review of amendments incorporated by the Office of the Assistant Commander-in-Chief Headquarters Strategic Air Command's Los Angeles, California (collocated with AFBMD). The review was completed and comments were submitted to the SAC office on 22 March. SAC completed the plan in April but as of the end of June the plan had not been approved.[x]

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[x] BMO (MCPTA) DF to MCPT, 20 Mar 58, subj: Weekly Diary - 14 thru 20 Mar 58; History of the SAC, Historical Study No. 72, 1 Jan - 30 Jun 58.

In the meantime Rome Air Development Command had awarded a contract to Ramo-Wooldridge Corporation in May 1958 for design and implementation of the Intelligence Data Handling System, Subsystem I, and ~~Director of Defense~~-- the Secretary of Defense had transferred WS 117L program to Advanced Research Projects Agency effective 19 May 1958.

And SAC had ~~[illegible]~~ established a ~~[illegible]~~ center in the facility in Denver on 13 June 1958

Colonel Frederic C. E. Oder, Director for WS 117L at AFBMD requested ~~the~~ that the WS 117L Site Selection Board consider the problem of siting the Intelligence Center for WS 117L, and requested decision be made on Offutt Location of the facility as proposed in SAC's Preliminary Operational Concept ~~Development Plan~~. Headquarters The Director of Operations, Headquarters USAF, requested that the Offutt location be placed on the Agenda of the WS 117L Site Selection Board Meeting scheduled for 22 July 1958 so that formal action could be accomplished.[x]

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[x] Msg, WFBMD WDTSR 6-17-E, 13 Jun 58; Msg HQ USAF AFOOP-OC-R 53126, 13 Jul 58.

On 1 July 1958, General Schriever ~~Colonel William A. Sheppard, Assistant for Special Projects,~~ requested that in connection with Colonel Frederic C. E. Oder's request that the WS 117L Site Selection Board ~~be~~ consider siting of theIntelligence Center , that a full-scale site selection for the facilite not overlap similar in nature ~~other~~ requested decisions ~~regarding siting~~ . There were current proposals relative to use of satellites for communications, weather, anti-ballistic missile early warning ~~that required siting~~ under consideration and the communications net and organizational provision eeu would overlap those required for intelligence purposes.[x]

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[x] MSG WDD WDGO-6-4, 1 Jul 58.

On 2 July 1958, Schriever, Brigadier General Ritland, Colonels Terhune, Sheppard, Evans, and Oder, and LtColonel Boatman attended a meeting relative to the Operational Planning for WS 117L. The following actions were directed:

a. A letter would be sent to the ~~Air-Force-ballistic-Missile-~~ Assistant Chief of Staff for Guided Missiles, which would furnish an AFBMD draft of the ARS Preliminary Operational Concept. It was to be the same as that published by Headquarters USAF except that it would generalize on the definition of the hardware involved in lieu of the specific definitions in the Headquarts ers USAF version. The letter would advise that AFBMD was developing a Data Utilization Plan (DUP) for the Research and Development flights of WS 117L which would be submitted no later than the next revision of the WS 117L Development Plan.

b. A team under Deputy Commander for Technology (AFBMD) would be formed without delay to evolve the DUP. The DUP would be responsive to the AFBMD Preliminary Operational Concept.

c. The DUP would be submitted as the Operational Annex to the next WS 117L Development Plan-submission [illegible]

d. Strategic Air Command would be held responsible for submitting and supporting their hardware and facilities requirements for operational use of WS 117L and coordinating the requirements with AFBMD. The problem of establishing a schedule for such operations would be between Commander in Chief Strategic Air Command and Headquarters USAF. The manner by which SAC's requirements would be programmed (AFBMD Development Plan versus normal SAC channels) would be determined after the requirements had been received.

e. The team referred to under paragraph b, above, would also develop a National Operational Concept for WS 117L. The concept would be more broad and inclusive than the ~~present~~ already prepared Preliminary Operational Concept. The Concept and the fact it was under preparation would be closely held within AFBMD.[2]

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[2] WDG Memorandum for the Record, 2 Jul 58, subj: Operational Planning for WS-117L.

At this point in time in the research and development of the Air Force military space system, the program was beset by money shortages; Roy Johnson, the Director of Advanced Research Projects Agency, had cancelled the reconnaissance aspects of the Thor-booster phase of WS 117L -- ~~an accelerated plan~~ a plan to accelerate the ~~program~~ WS 117L Program that Johnson exploited so as to promote a Man-In-Space program-- and had substituted experimental flights and recovery of laboratory animals;

ARPA has assumed responsibility for the Advanced Reconnaissance Satellite effective 30 June 1958;

President Eisenhower had asked Congress for a civilian agency to conduct all space activities except those primarily associated with military requirements; there had been only one ~~space-launch~~ Air Force space launch, ~~that-of-"Able-0"~~ ~~an-Able-launch,~~-- an interim space program, the Able series ~~first-launch-of~~-- unsuccessful launch of 23 April 1958; ~~the-first-[illegible] launches had been reduced from four to two to take place from the Atlantic Missile Range during the first half of Calendar year 1960~~; ~~The-first scheduled-launch~~ And the first flight test for Sentry (ARPA's designation) was ~~were~~ scheduled fe no earlier than 30 November 1958 and that was for the animal experimental series, whereas the original Thor-boosted phase was called for the first ~~flight~~ scheduled flight in October 1958. ~~General~~

General Thomas S. Power. ~~Had become~~ Commander-in-Chief of the Strategic Air Command on 1 July 1957 after having been the Air Research and Development Command commander since 15 April 1954, and General Power had apparently laid the groundwork for the eventual operational control of WS 117L. By 30 June 1958, General Power had written the Chief of Staff setting forth his ideas as to why the intelligence center should be at Omaha.[x]

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[x] Draft "Comments on Space, Etc." 30 Jun 58, prepared at AFBMD.

It was AFBMD's plan to make some kind of peaceful ~~treaty~~ compromise with the Strategic Air Command ~~in order~~ so that progress could be made in the development of a space system as a whole.[x]

AFBMD submitted its Preliminary Operational Concept WS 117L to the ~~Chief-of-Staff, USAF~~ Assistant Chief of Staff for Guided Missiles, Headquarters USAF, on 15 July 1958, and as planned in the 2 July 1958 meeting, notified the Assistant Chief of Staff for Guided Missiles that a Data Utilization Plan was under preparation that would be submitted not later than the next submission of the WS 117L Development Plan.[x] AFBMD published the ~~The~~ Sentry Operational Annex ~~was p~~ on 15 September 1958 at the same time date of the next WS 117L Development Plan. The Operational Annex ~~is not available but the Operational Annex to the Sentry Development Plan, 30 January 1959, provided for a "useful capability prior to the projected operational ready date of October 1961." The Annex also provided that the Data Processing Development Laboratory at Denver--location of the 4999th Data Processing Squadron/later activated as effective 1 July 1959 as the 6594th Data Processing Squadron, Lowry Air Force Base,~~

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[x] Ibid.

[x] Ltr WDD (WDTSR) to Chief of Staff, Hq USAF, 15 Jul 58, subj: Preliminary Operational Concept WS 117L.

was approved in principle by the Air Force Ballistic Missile Committee on 16 October 1958. ~~The-Strategic-Air-Command--concurred-in-~~ The Assistant Chief of Staff for Guided Missiles, Headquarters USAF, in a letter to the Commander-in-Chief, Strategic Air Command, concurred in the Commander-in-Chief's proposal for ~~ab~~ ~~-of-~~ an October 1961 Initial Operational Capability (IOC) for WS 117L. The letter is quoted as follows: x

> Based on the national need to obtain warning and other intelligence information at the earliest practical date, this headquarters concurs with your proposal for an October 1961 Initial Operational Capability for WS-117L. Pending review and approval by the Department of of Defense, actions required to program for the procurement of additional vehicles will be accomplished by this headquarters.

~~Is~~ in July 1958 ~~It-had-been-General-Schriever's-contention-that-General-Power's-~~ General Power had sent a request to the Chief of Staff containing ~~request-to-the-Chief-of-Staff-~~ proposed operational dates for WS 117L based upon Research and development schedules submitted by AFBMD in the WS 117L Development Plan, dated 15 March 1958? ~~Subsequent-to-~~ The AFBMD Vice Commander, Brigadier General Ritland had notified ~~March-fund-limitations~~ the Chief of Staff, USAF that an operational program conducted concurrently with the firings listed in the development plan would require diversion of resources from the research and development program, and funds for additional efforts would have to be provided over and above the funds programmed for Research and development.x

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x Msg, AFCGM 3393, 5 Feb 59.

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x ~~Memoran-~~ WDGO AFBMD (WDGO) Memorandum for General Large, sgd Schriever, 12 Sep 58, Subj: Change in WS-117L Schedules; Msg, AFBMD, WDTSR 7-25-E, 25 Jul 58

~~On~~ By letter dated 5 August 1959, General Curtis E. Lemay,* Vice Chief of Staff, USAF, notified the Commander, ARDC, that the Strategic Air Command had been designated as the command responsible for operational planning for employment and control of the Advanced Reconnaissance Satellite System, ~~WS-117L,-(SENTRY).~~ WS 117L, (Sentry). Other instructions were as follows:

> The Air Research and Development Command, in collaboration with the Strategic Air Command, will provide assistance, as necessary, to develop the capability to exploit the system to its fullest and at the earliest possible date.
>
> It is recognized that during the research and development phase the Advanced Reconnaissance Satellite System will have operational potential; therefore, in addition to the above instructions, the Strategic Air Command will be responsible for processing data obtained from all reconnaissance satellites and for providing information and data necessary to the continued development and improvement of the SENTRY system

The Director of Plans/ SAC Major General Charles B. Westover, notified the ~~Strategic-Air-Comman~~ Office of the Assistant Commander-in-Chief, ~~collocated-with-AFBMD,~~ that ~~the~~ LeMay's action required development and publication of the SAC Sentry Preliminary Operational Plan, and requested the Los Angeles office prepare a draft of the plan and forward it to the SAC headquarters for staffing and finalization by 10 September 1959.

On 20 August 1959, Assistant Deputy Commander for Military Space Systems, AFBMD, Colonel Harry L. Evans ~~wrote-his~~ furnished the Los Angeles SAC office the AFBMD interpretation of ~~the~~ General LeMay's letter of

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* [illegible] SAC from [illegible] 1957.

5 August 1958 and ~~is~~ attached a proposed revision of Sentry Operational Planning Procedures, an agreement between SAC and ARDC for the development of a Sentry operational capability requiring it function under the cover of an ARDC Research and development program.[x] ~~Colonel-John F.-Batjer,-Assistant-Commander-in-Chief-(Los-Angeles)-wrote-Headq-~~ ~~wrote-Headquarters-SAC-about---~~ A copy of AFBMD's letter of 20 August was handcarried to SAC headquarters (by SAC - MIKE) on 25 August 1959 where it was discussed with interested staff agencies and it was decided that Headquarters SAC would furnish a reply.[x] On 25 August 1959, the ~~SAC~~ Los Angeles SAC office also hand carried a draft copy of the [illegible] SAC [illegible] SAMOS[*] Preliminary Operational Plan, and had discussed the plan with interested Headquarters SAC staff agencies. However, the draft/SAC MIKE SAMOS Preliminary Operational Plan had not been coordinated with AFBMD because AFBMD had placed a different interpretation on the Vice Chief of Staff's letter of 5 August 1959.[x]

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[x] Ltr, AFBMD, WDZSO, to AC /Los Angeles SAC Office/ 20 Aug 59, subj: Interpretation of 5 August Letter from Vice Chief of Staff.

[x] Ltr, Col John F. Batjer, Assistant Commander-in-Chief, to SAC (DPL) 3 Sep 59, subj: Interpretation of Letter from Vice Chief of Staff

[*] DOD had ~~changed~~ ~~renamed-~~ changed name of program from Sentry ~~had-been-renamed-Samos-in-August-1959.~~ to Samos in August 1959.

[x] Colonel John F. Batjer, Assistant Commander-in-Chief to SAC (DPL), 10 Sep 59, subj: Assignment of Operational Planning Responsibility.

Following the re-definition of WS 117L program and the designation of three separate systems, Discoverer, Midas and Sentry, Headquarters USAF in a Top Secret message to the Commander ARDC and the Commander-in-Chief, Strategic Air Command, directed that pursuant to Presidential Directive, all US Space Satellites must be advertised as being solely for peaceful purposes. However, USAF acknowledged that the Air Force must develop a capability to use space for reconnaissance or other military purposes and seek congressional support for doing so, and that the programs designed as WS 117L and/or Sentry had previously been supported as military programs and advertised as reconnaissance satellites. The message is quoted in part as follows:

> Mr. Johnson, Director of Advanced Research Projects Agency, advertised that project discoverer and Project Midas are for peaceful purposes. Every firing into space, as well as ARDC's facilities and support of these programs must be associated with Discoverer, Midas or other projects declared to be for peaceful purposes. In view of this, Hq USAF is formulating a cover plan for all our space activities of a military nature. This entails, among other things, advertising ARDC as both developer and operator. The latest programming documents will indicate ARDC as the command to activate this system. Our intent to man this system with SAC personnel as well as ARDC personnel will not be indicated, nor will our intent eventually to transfer the entire system to SAC.

On 18 September 1959, the Secretary of Defense, Neil H. McElroy, notified in a Memorandum for the Chairman, Joint Chiefs of Staff, ~~regarding-let-it-be-known-made-in~~ made the following announcement:

among

> Although the research and development leading to the demonstration of operational feasibility will continue to be the responsibility of the Advanced Research Projects Agency for the time being, it appears desirable at this time to begin the development of a plan for the orderly transfer of space projects to the appropriate military departments. This transfer will normally be made during the development phase at an appropriate time to be determined by the Secretary of Defense.

~~Among assignments~~ specific assignments for payload development and payload research and development support and production (Musilow) [illegible] ~~interim satellite early warning system and~~ [illegible] improvement, approved was Phase I of satellite reconnaissance system to the Air Force. On 21 September 1959 Vice Chief of Staff USAF/Curtis E. LeMay notified Commander, ARDC that the Secretary of Defense had assigned to the Department of the Air Force the responsibilities for developing and launching all military space boosters (except for projects specifically reserved by the Department of Defense) and for performing necessary systems integration for military space systems, including those systems for which payload development responsibility had been assigned to other military departments.[x]

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x DAF Ltr to Comdr ARDC, 21 Sep 59, subj: Air Force REsponsibilities to Other Elements of the DOD for Space Systems.

the
siting of/facility for
Whereas, ~~the~~ the/Subsystem I, Data Processing, WS 117L had ~~been~~
~~the~~ appeared the greatest concern to SAC

~~O~~n 30 September 1959, ~~Hea~~ the Commander-in-Chief, SAC, requested Assistant for Advanced Technology, Deputy Chief of Staff, Development, USAF, to approve converting all of the Atlas facilities ~~launch-stands-of-the~~ see opposite page Atlas /65-1 facility on Vandenberg AFB ~~be converted~~, starting in April 1961, to operational Samos launch stands.[x]

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[x] Msg, CINCSAC, DPLB 2999 to Hq USAF, 30 Sep 59.

In July /Advanced Research Projects Agency had deferred development of the Sentry ~~(SAMOS)~~ reconnaissance recovery capsule ~~because-of-lack~~ and gave ~~the-reason-for-the-deferral~~ lack of funds as the reason for the deferral. Vice Chief of Staff LeMay

On 21 October ~~the Commander, ARDC, notified AFBMD that the SAMOS-development~~ Headquarters USAF required revised development
Line for Midas and Samos
plans because of the Secretary of Defense approval of the assignment to the Air Force of the Phase I of the Satellite Reconnaissance System. ~~ARDC~~ The Air Force required ARDC to ~~ww~~ prepare the Samos Development plan, SAC to prepare the/Samos Operational Plan and Air Materiel Command to prepare the/Samos Logistics Support Plan, and invited fullest collaboration of all participants ~~was-dir~~in the formulation of the plans ~~was directed~~.[x]

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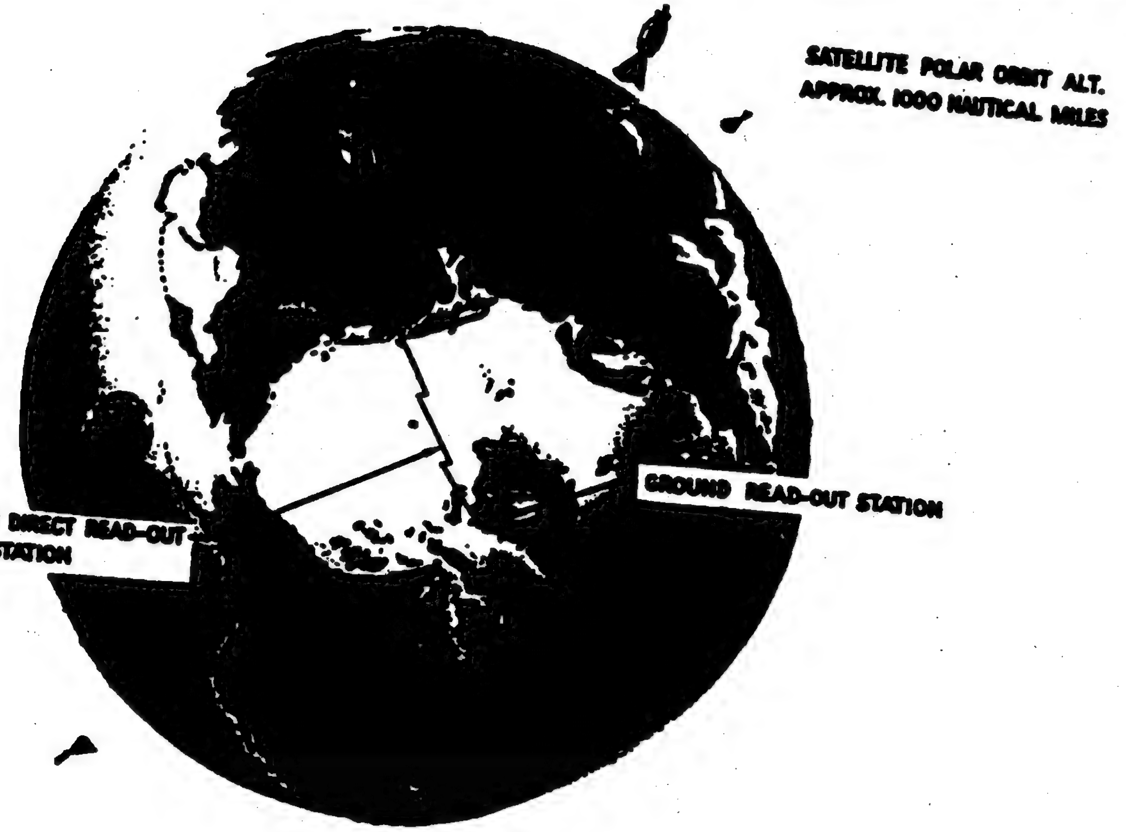
[x] Msg, ARDC, RDRRB-20-10-1-E, 21 Oct 59.

[redacted]

~~SECRET~~


SATELLITE POLAR ORBIT ALT.
APPROX. 1000 NAUTICAL MILES
GROUND READ-OUT STATION
INSTANTANEOUS DIRECT READ-OUT
TO GROUND STATION

~~SECRET~~

Figure ______. WS-117L INFRARED RECONNAISSANCE [illegible].
ICBM ATTACK WARNING
contained in New Horizon Briefing Report illustrates how satellite vehicles equipped with Infrared Sensing devices could detect and instantaneously report to a USAF-controlled ground station the launching of ballistic missiles having an intercontinental range capability.

Subsystems A, B, C, D, and H were common to Sentry and Discoverer.

Subsystem "G" - Infrared Reconnaissance, ~~used only in the~~ the MIDAS ~~System~~ payload was described in the 30 January 1959 Development Plan as follows:

> This subsystem consists of the complete infrared payload. This payload includes an infrared scanner, programmer and command circuitry, readout electronics, and an encoder to modulate a transmitter. Command channels will be utilized to select and execute the functions of sector scan, system test, telescope up, telescope down, and filter sensitivity. The sector search command causes repetitious scan reversal over a localized area. The filter change command initiates removal or replacement of the filter, enabling the payload to sense the presence of IR emission in either the 1.8 to 2.8 or 2.65 to 2.8 micron wave length region. Ground equipment will consist of a recorder and an analog electro-mechanical presentation unit for changing the frame of reference of the display from the circular view area of the vehicle to a ground map of the area over which the vehicle scan pattern passes.

During the period from May 1958 when Secretary of Defense placed MIDAS, as part of the overall WS-117L Program,under management direction of Department of Defense Advanced Research Projects Agency, and November 1959 when Secretary of Defense reassigned MIDAS to the Air Force for management responsibility primary emphasis was placed on research in the satellite element of MIDAS. Funding for FY 1959 was limited to approximately one-half that required to conduct the planned system development program. ARPA reduced four test launches programmed for launch from the Atlantic Missile Range during the first half of calendar year 1960 to two launches.[x]

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[x] Space System Development Plan MIDAS Program, 29 Mar 62, p 1-4

Air Force Ballistic Missile Division launched its first MIDAS vehicle from Atlantic Missile Range on 26 February 1960. The first stage was a standard Air Force Atlas booster that had been modified to accommodate MIDAS I. With adapter section, the height was approximately 77 feet and its launch weight was approximately 260,000 pounds.[x] A summary of the first nine MIDAS launches[*] and five Develop- Radiometric Measurement payload piggyback experiments follows:

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[x] MIDAS I Fact Sheet, Release 2-14 (undated).

[*] Extracted from LMSD Program 461 Historical Monograph, 15 Jun 65.

26 Feb 60	MIDAS Flight I, Vehicle 1008 launched from Cape Canaveral	Shortly after launch, at Agena separation, an Atlas explosion terminated the flight, and orbit was not achieved. See Section 7.1-2, MIDAS Flight Test Results, for details.
24 May 60	MIDAS Flight II, Vehicle 1007 launched from Cape Canaveral	Vehicle 1007 successfully achieved orbit, however, malfunctions in several satellite subsystems precluded payload (Series I) observation of target missiles. See Section 7.1-2, MIDAS Flight Test Results, for details.
20 Dec 60	RM-1 launched from VAFB	(See 11 January 1961.)
11 Jan 61	Analysis of RM-1 flight	Preliminary evaluation of the RM-1 data was in final stage of completion. (In this successful Discoverer flight on 20 December 1960, a radiometer in the satellite telemetered information on infrared radiation for use in the MIDAS Program.) Indications were that the level of background radiation in the 2.7-micron region was roughly the same magnitude as determined in the MIDAS balloon measurement program. The level of background in the 4.2-micron region appeared to be considerably higher than anticipated.
18 Feb 61	RM-2 launched from VAFB	Launched aboard Discoverer vehicle 1102, the nonrecoverable radiometric payload (virtually identical to the RM-1) functioned satisfactorily for two orbits until the Agena attitude control failed and the vehicle began to tumble.

12 Jul 61	MIDAS Flight III Vehicle 1201 launched from PALC	Agena separation and first and second engine burn occurred satisfactorily, and a nominal orbit was attained. However, one solar array did not extend properly, thereby reducing available battery charging power. A failure in the ground-based command and control system prevented activation of the payload during early passes, and by Pass 6 the internal power load had depleted the batteries to the point where no further transmissions were detected from the satellite except from SAPUT No. 1 and 2.
21 Oct 61	MIDAS Flight IV, Vehicle 1202 launched PALC	An Atlas roll-control failure during ascent prevented the Agena satellite from achieving the proper orbital trajectory. During first and second burn cycles the expenditure of attitude control gas was excessive, and during Pass 1 attitude perturbations persisted and the control gas was exhausted. Due to the instability of the vehicle, a solar array sun tracker failed after Pass 4 and thereafter electrical power expended was greater than that generated. Power was depleted after Pass 56 and all equipment shut down. No target missiles were detected by the payload.
9 Apr 62	MIDAS Flight V, Vehicle No. 1203 launched from PALC	MIDAS V (Agena No. 1203) was launched on schedule from Point Arguello Pad 2 at 7:05 a. m., PST. Vehicle operation during the first six passes was satisfactory (data links failed on Pass 7) and several important operations were successful: ● The vehicle assumed and maintained a stable nose-down attitude
2[illegible] ug 62	RM-3 launched from VAFB	Radiometric Flight RM-3 was successfully orbited piggyback on Discoverer Vehicle 1153. Infrared background data were obtained and processed for 42 orbits.

~~SECRET~~

29 Sep 62	RM-4 launched from VAFB	RM-4, identical to RM 3, was successfully orbited on Discoverer Vehicle 1154. Satisfactory data were received from the radiometer for 49 orbits. The number of data samples obtained exceeded all previous RM flights despite several vehicle electrical problems, and extended the knowledge of background radiation characteristics.
17 Dec 62	Program 461* Flight VI, Vehicle 1205 launched from PALC 1, Pad 2	This first Series III flight was aborted 80 seconds after liftoff due to a failure of the Atlas booster. No failure of the Agena B occurred.
9 May 63	Program 461 Flight VII, FTV No. 1206 launched from PALC	Vehicle No. 1206 accomplished the primary objective of detecting target missiles of various sizes, and performed with outstanding success for 47 days. This performance demonstrated, without any doubt, the technical feasibility of the 461 System and gave rise to optimism as to the future of the program.
12 Jun 63	Program 461 Flight VIII, FTV No. 1204 launched from PALC	Vehicle 1204 failed to achieve orbit due to a first-stage-booster malfunction. Both vehicles impacted downrange.
18 Jul 63	Program 461 Flight IX, FTV No. 1207, launched from PALC	Orbit was successfully achieved; however, one solar array did not open and telemetry Link II functioned improperly. After 11 days of successful payload operation, during which one target missile was detected, the AC power system failed, resulting in the loss of attitude control and payload operation. Prior to this failure the payload operated at a much longer duty cycle per pass than did Vehicle 1206. This resulted in recording over 7 billion payload data points as compared with 4 billion for Vehicle 1206.
9 Nov 63	RM-5 launched from VAFB	Due to a failure of the first stage booster (Thor), Agena 1171 with the DRM-5 piggyback payload did not attain orbit.

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* After Department of Defense issued its DOD Directive No. S-500-13, 23 March 1962, Security and Public Information-Policy for Military Space Programs, ~~the~~ ~~Air Force the~~ Program Number 461 was assigned the system effective 6 August 1962.

~~SECRET~~

MIDAS contractual coverage was included in the original Letter Contract AF 04(647)-97 ~~award~~ Western Development Division (ARDC) awarded Lockheed Aircraft Company on 29 October 1956 for the overall WS-117L Program. The contract was definitized 12 December 1957. A Follow-on contract No. AF.04(647)-347 initiated in March 1959 included a separate Work Statement for MIDAS. The contract was definitized into a separate MIDAS Contract No. AF 04(564)-564 initiated on 3 May 1960 effective from 1 July 1959 to 30 June 1962. Letter Contract No. AF 04(647)-787 initiated on 7 February 1961 for a minimum and augmented program was effective 17 February 1961 to December 1966.x

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x LMSD Program 461 Historical Monograph

AFBMD awarded Contract No. AF 04(647)-594 to the Aerospace Corporation to assist the MIDAS Program Office, Space Systems Division* (AFSC) ~~to~~

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* Reorganization of Air Research and Development Command on 1 April 1961 resulted in ARDC becoming Air Force Systems ~~Divis~~ Command and Air Force Ballistic Missile Division becoming Space Systems Division.x

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by performing general systems engineering and technical direction of the MIDAS Development Program.x

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x Space Systems Development Plan MIDAS Program, 29 Mar 62.

Major subcontractors to the prime contractor for Subsystem G (Infrared Payload) ~~are as follows~~ and their functions as of 29 March 1962 were as follows:

Electronics Corporation of America, Detector Study
Arthur D. Little, Inc., Thermal Design, Detector Cooling
General Electric Company, Situation Display Console
Laboratory for Electronics, Reliability Study
Baird Atomic, Inc., IR Payload Scanner
Infrared Industries, Inc., Lead Sulfide Detectors

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x Space System Development Plan MIDAS Program, 29 Mar 62.

Fiscal Year 1964 Budget Estimate and Revised ~~Fiscal Year~~ fiscal year 1963

Financial Plan Summary of Requirements by Major Items

: as shown in MIDAS Development Plan dated 29 March 1962
were
was /as follows:

Prior Year:	$205.4M
Fiscal Year 1962:	$164.1M
Fiscal Year 1963:	$169.9M
Fiscal Year 1964:	$182.2M

The Revised Fiscal Year ~~1960~~ 1959 Financial Plan/ Summary of Requirements as shown in MIDAS Development Plan dated 15 January 1960 was $29.847M and the Revised Fiscal Year 1960 Financial Plan/ Summary of Requirements as shown in MIDAS Development Plan dated 24 October 1960 was $86.9M.

SENTRY

Following re-definition of WS-117L Program, the Director of Advanced Research and Projects Agency identified and defined Sentry (the name ARPA had given WS-117L) as "a series of satellite launchings, utilizing initially the Atlas ICBM with an upper stage that will employ both film recovery and film readout techniques for the purpose of conducting visual and ferret reconnaissance."[x]

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[x] ARPA Memorandum for the Secretary of the AF, 12 Feb 59, subj: Policy Relating to the Official Identification of Projects DISCOVERER, SENTRY and MIDAS.

On 7 August 1959 ARPA redesignated the program SAMOS (Satellite and Missile Observation System). The Secretary of Defense approved the transfer of SAMOS from ARPA to Department of the Air Force on 17 November 1959 along with MIDAS and DISCOVERER programs.

Rearrange by moving forward & consolidating w pages beginning p. 111

AFBMD presented two Development plans to headquarters 12-14 December 1959, one of which was a plan for Research and Development and the other was an operational plan. As the result of the presentation, Headquarters USAF furnished AFBMD further guidance and funding information that called for new development plans. AFBMD prepared new plans dated 15 January 1960.

One plan encompassed the basic Research and Development program and the other plan outlined the operational aspects of the program. The Air Force withheld the operational FY 1960 and FY 1961 program because a separate Air Force operational program as that would be to the detriment of the national interests.[x] The SAMOS Development Plan provided for a 25 flight vehicle program allocated within the fund limitations of $160.0M in FY 1960 and $199.9M in FY 1960.[xx]

The first SAMOS Research and Development Plan, 15 January 1960 identified 10 technical areas or subsystems representing both space and ground design activities to be developed as follows:

Subsystem A - Airframe
Subsystem B - Propulsion
Subsystem C - Auxiliary Power
Subsystem D - Guidance and Control
Subsystem E - Visual Reconnaissance
Subsystem F - Ferret Reconnaissance
Subsystem H - Command and Control
Subsystem I - Data Processing
Subsystem J - Geophysical Environment
Subsystem K - Qualitative Personnel Requirements Information

Subsystems A, B, C, D, and H are were were common to Discoverer and MIDAS. Subsystems J and K are were common to the Discoverer Program. Subsystems E, F, and I were ~~are~~ used on SAMOS only. ~~The first development plan showed~~ program_objectives_of Subsystems E, ~~F, and I~~ program_objectives

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[x] Space System Development Plan, SAMOS R&D Program, 11 Aug 60; Msg, SAC, VC 5540; 14 Dec 59; Msg, SAC, VC 5541, 14 Dec 59.

[xx] Ltr, WDZP to Hq USAF (AFDAT) 30 Jan 60, subj: Transmittal of Discoverer, SAMOS and MIDAS, development plans

As shown in Samos R&D Development Plan, 15 January 1960, program objectives of Subsystem E (Readout and Recovery) follows:

1. Readout

a. Visual Reconnaissance (Subsystem E)

Indirect for quote

The reconnaissance equipment for the visual reconnaissance readout portion of the SAMOS Program consists of the satellite-borne equipment required to collect information in the visible spectrum, to process and store this information, and on a command signal from the ground to convert stored images to appropriate signals for transmission to the ground. In addition to the satellite-borne equipment, related ground-based equipment will be required to take the output of the satellite-borne data link and reconstitute the signal into photographic form for system control, further processing and intelligence use. The ability to view the system output provides a means of adjusting vehicle capability. The long life of the readout vehicles permits economy of operation by reducing the total number of vehicles and launch pads required to attain a particular capability. Initial visual equipment is to be capable of resolving targets 20 feet in size, and a limited study will continue toward the goal of achieving resolutions of 5 feet or less. Target location will have an error no greater than 1 mile with respect to the North American Datum. The readout system provides rapid return of reconnaissance data on a repetitive basis. The system will collect perishable intelligence information of selected targets as determined by the programming of vehicle operation. The steerable payload permit coverage up to 150 miles each side of the orbit path. Consideration will be given to the use of advanced sensors such as electrostatic tape. The incorporation of a reuseable storage medium will allow for larger active life on orbit. Within the resources available, effort will be applied to the photographic approach in order to improve the early capability prior to the time that the electrostatic tape systems could be available. The visual reconnaissance readout payloads have been defined as follows:

(1) E-1 Component Test Payload

(2) E-2 Steerable Payload providing 20 foot ground resolution

(3) E-3 Steerable Payload providing 5 foot ground resolution. (NOTE: This work will be limited to study effort. Flights are not scheduled for this payload.)

* * *

insert quote - indent

2. Recovery (Subsystem E)

a. The recovery portion of the SAMOS Program will provide a [illegible] load (E-5) which will be designed to obtain high resolution photographic [illegible] naissance and is to be capable of achieving 5 foot ground resolution with a [illegible] location accuracy of one nautical mile. The system will have an active [illegible] life of 15-30 days and will permit coverage of selected targets. The data will be returned to earth in a recovery capsule ejected from the satellite vehicle. The recovered film will be delivered to the Data Processing Subsystem for processing.

b. The recovery system makes possible an earlier achievement of 5 foot ground resolution since the vehicle will orbit at a lower altitude and the original film will be recovered. The lower altitude restricts the useful life but it provides the capability to obtain wide area coverage in order to collect durable type of intelligence information which supports the readout operation.

~~SECRET~~

Contractual Coverage X

~~Sub[illegible]~~ x Prior to 2 April 1957, Lockheed Aircraft Corporation had awarded subcontracts to the ~~following-listed-contractor~~Eastman Kodak Company, Apparatus and Optical Division, for ~~the following Project-1759~~ Subsystem E (Project 1759). WDD approved [illegible] Separate Tasks are listed below.x

a. Task No. 39812, Reconnaissance Camera. The task covered the development of cameras and lenses for the photographic recording of the target area.

b. Task No. 39813, Automatic In Flight Processing. The task covered the development of an automatic unattended film processor for use in the satellite vehicle.

c. Task No. 39814, Automatic Data Readout Equipment. The task objective was to develop a means of automatically scanning pictoral data recorded on photographic negatives in a satellite vehicle.

d. Task No. 39815, Subsystem Controls. The task covered the development of control and transport mechanisms for the functioning of the components and the handling of the film in the vehicle.

[illegible] WDD (WD TR,) [illegible] LMC, [illegible]

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x RDB Project Card, 2 Apr 57,(An initial report on the project).

[illegible] AF (1[illegible]) [illegible]

e. Task No. 39816, Ground Processing Equipment. The task objective was to develop means for recording the video output of the Visual Data Link receiver in a form compatible with subsequent operations of the WS 117L Data Processing Subsystem.

f. Task No. 39821, Meteoroligical Data Requirement. The task objective ~~of the task~~ was to determine the requirements for meterological data collected from a satellite. Air Force Cambridge Research Center, Atmospheric Analysis Laboratory/Geophysical Research ~~Division~~ Directorate performed In House Effort under Obligating Authority 57-16 dated 25 June 1957, $422,000. The Center in turn awarded Study Contracts AF 19(605)-1754 to Florida State University and AF(604)-1589 Harvard College (Blue Hill Observatory).

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x Systems Development Plan, AR Plan, WS-117L, 2 Apr 57; RDB Project Card, Project 1759, 2 Apr 57; Summary Description of Ballistic Missile Contracts by 117L Weapon System - ARS as of 31 Mar 58; Mgmt Rpt ARS 31 Jan 57.

In June 1959 Advanced Research Projects Agency instructed AFBMD to defer work on Subsystem E recovery program pending an ARPA program review. The reason ARPA gave for the deferral was fund limitations due to the demands of other programs.[x] Lieutenant General Bernard A. Schriever, Commander, Air Research and Development Command, was deeply concerned over the deferment of the recoverable capsule, of which he wrote the Chief of Staff USAF.[x] General Curtis E. Lemay, US Air Force Vice Chief of Staff was completly sympathetic with General Schriever's point of view and took "action through secretarial channels to restate the Air Force requirement to the Director of ARPA and request reconsideration of its support in FY 60."[x] On 2 October 1959, Headquarters USAF notified the Commander, AFBMD to reflect the total available dollars for Fiscal Year 1960 of $148.0M in the Development Plan AFBMD was preparing for ARPA and that "No consideration should be given in the plan for any financial support from Air Force for the recovery program." Headquarters USAF wanted every effort be made to accommodate both the Readout and Recovery programs within the $148.0M,"[x] and on 7 October 1959

[illegible]

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[x] Space Systems Development Plan, Samos R&D Program, 15 Jan 60, p I-1-3.

[x] Ltr, Gen Schriever to Gen Thomas D. White, CofS, ~~Sep~~ 1 Aug 59, no subj.

[x] Msg, RDZGW-2-10-4E, 2 Oct 59.

[x] Msg, AFDAT 78900, 2 Oct 59.

Headquarters USAF notified Commander AFBMD to furnish complete costs by fiscal year, and launch schedules for development of the recovery capsule and E-5 Camera. (The E-5 payloads were designed to obtain high resolution visual reconnaissance and capable of achieving 5 foot ground resolution with a location accuracy of one nautical mile.)[x] The Fiscal Year 1960 estimate required "should reflect amount required and not being provided by ARPA from the $148.0 Million Dollars. For this exercise consider a go-ahead of 1 Dec 59. These costs are not to be included in development plan being prepared for submission to ARPA this month."[x]

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[x] SAMOS Development Plan, 11 Aug 60, p -12-10

[x] Msg, AFDAT 80589, 7 Oct 59.

On 17 November 1959 the Secretary of Defense approved the transfer of SAMOS from ARPA to Department of the Air Force. ~~As-already-stated-~~ AFBMD. ~~AFBMD~~-submitted development plans 14-16 December 1959 but ~~the-~~ Headquarters USAF ~~needed-additions~~ furnished further guidance and funding instructions that called for the submission of a new development plan that would include ~~emphasisising~~ emphasizing photo over ferret and earliest possible flight demonstration of readout and recovery with "preferential emphasis on recovery."[x]

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[x] Samos Development Plan, 15 January 1960.

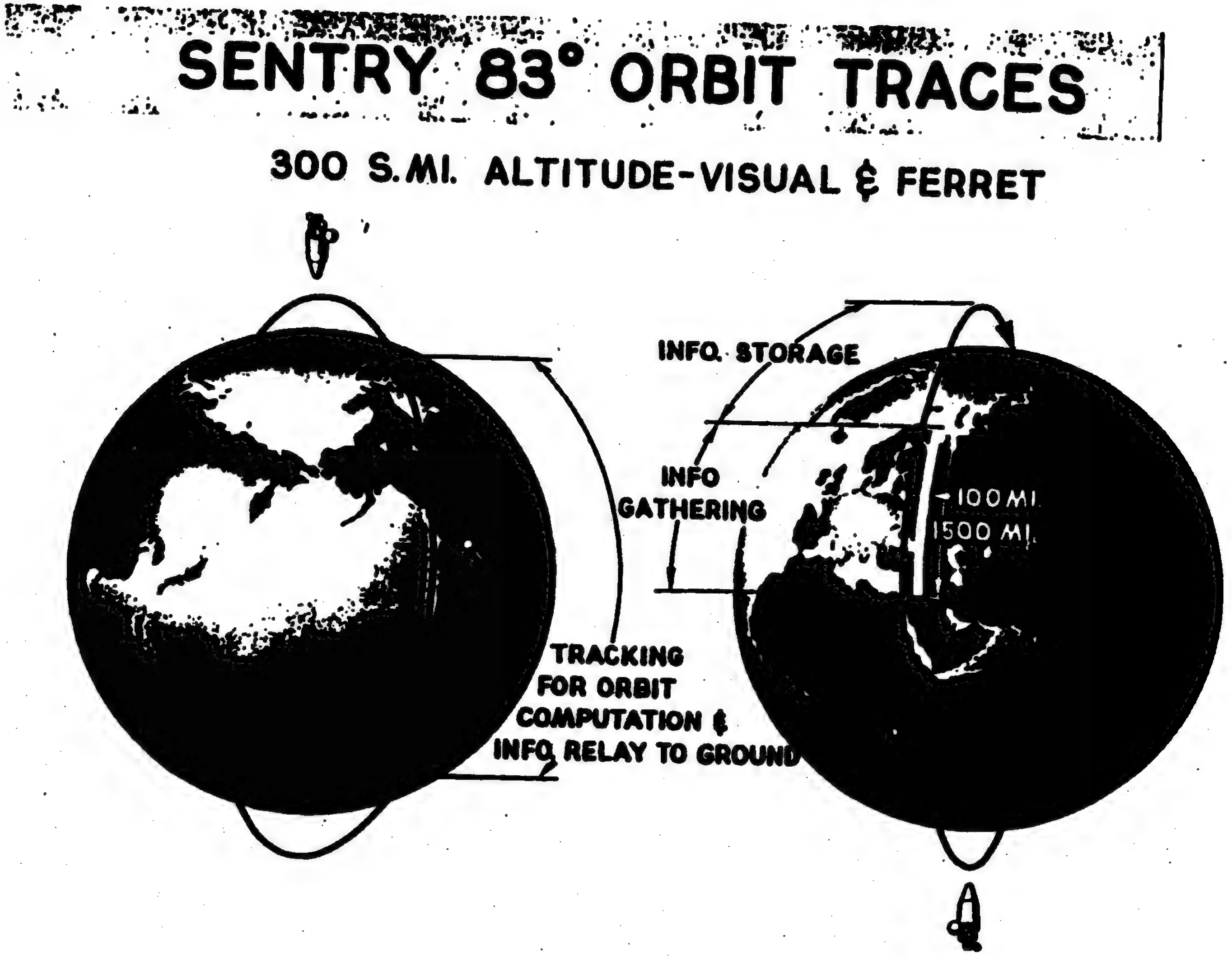
SENTRY 83° ORBIT TRACES
300 S.MI. ALTITUDE-VISUAL & FERRET
INFO. STORAGE
INFO GATHERING
100 MI.
1500 MI.
TRACKING FOR ORBIT COMPUTATION & INFO RELAY TO GROUND

Figure 5. Photo ~~Secret~~ Caption ~~Confidential~~

Concept of operation of the Ferret and Visual subsystems for the 117L SENTRY Weapon System. The development model of the airborne portion of Subsystem "E", Visual Reconnaissance, is nearing completion and delivery is expected in November. (WDPCR-58-3)

Subsystem F

As shown in Samos R&D Development Plan, 15 January 1960, program objectives of Subsystem F follows:

b. Ferret Reconnaissance (Subsystem F)

(1) The ferret reconnaissance portion of the SAMOS Progr[illegible] consists of the satellite-borne equipment required to collect information from radiation in certain selected regions of the electromagnetic spectrum, to store this information, to filter or index it as may be necessary, and [illegible] the proper time to convert the stored information into an appropriate electrical signal for transmission to the ground. Ground-based equipment will be required for inflight calibration and vehicle equipment adjustment, engineering evaluation of vehicle equipment performance, and transmission of reconnaissance, calibration, attitude, and time information to the data processing activities.

(2) This subsystem includes the equipment to conduct a program of increasing sophistication to provide a system capable of conducting effective satellite reconnaissance of the entire Soviet Bloc. This system will initially produce a general coverage vehicle (F-2) and a specific mission vehicle (F-3) capable of total coverage of the frequency spectrum from 59-18,000 mc/s. This will provide general coverage of the Soviet Bloc every five days and a capability to take close looks at all signals of interest. Indications of unusual signals and activity will be incorporated in the F-2 vehicles so that the F-3 system can then be programmed to produce data for complete analysis of these signals. Eventually an F-4 system will be produced which will accomplish these missions more effectively using advanced techniques and combining the advantages of both type systems.

Contractual coverage: Missile Systems Division, Lockheed Aircraft Corporation, requested proposals for Subsystem F from the following named contractors in the Spring of 1957:[x]

Haller, Raymond and Brown, Inc., State College, Pennsylvania
Ramo-Wooldridge Corporation, Inglewood, California
Airborne Instruments Laboratory, Mineola, New York

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[x] Colonel Order Memorandum for Colonel Terhune, 26 Feb 57, subj: Subcontractor Competition - WS 117L.

After Lockheed Aircraft Corporation evaluated the proposals and submitted their recommendations to Western Development Division, Lockheed awarded contracts to two principal subcontractors, Haller, Raymond and Brown, inc., and Airborne Instruments Laboratory, a division of Cutler-Hammer, Inc.[x]

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[x] DISCOVERER, SENTRY, MIDAS Satellite Development Programs, Jan 59, prepared by Lockheed Aircraft Corp, Missiles and Space Div.

Subsystem 1

The program objectives of Subsystem I as shown in Samos R&D Development Plan, 15 January 1960, follows:

5. Data Processing (Subsystem I)

The outputs of Subsystem I are designed to provide information and source material in quantities and formats to satisfy the requirements of all members of the intelligence communities. Subsystem I data processing will be oriented to provide for the rapid processing, redirection, screening, titling and transcription of the raw reconnaissance data received into the required formats that will permit immediate use of the data by the appropriate intelligence agency. This timely processing capability will make it possible to contribute information for the assessment of imminence of attack and for the rapid feedback of technical data for efficient system operation, as well as provide data that is useful in long term analysis for military targeting, measuring changes and activity of military and industrial complexes, and evaluating technological progress. As the full system capability evolves, control and scheduling of reconnaissance coverage of the satellites become increasingly important and complex. Thus, the programming of intelligence requirements into the system, the quick review of mission success, and output of resulting reconnaissance data to user agencies, will require careful consideration and planning.

Headquarters USAF (Assistant D for Advanced Technology, Deputy Chief of Staff, Development) requested the plans arrive Headquarters, USAF, no later than 23 November 1959 so that the plans ~~would~~ could reach the Secretary of Defense no later than 1 December 1959. Other directions included the following:*

> Plans will reflect agreed earliest logical date of transfer of 6594 Test Wing from ARDC to SAC after attainment of initial operational capability for Samos by ARDC.
>
> Responsibility for launch and orbit injection of both Samos and Midas will be assigned to SAC upon gaining 6594 Testing.
>
> Samos-Midas tracking and acquisition stations will be controlled and manned by SAC with ADC representation as required.
>
> When both systems become operational, launch, orbit injection, tracking and acquisition of Midas satellites and technical operation of Midas satellites in orbit will have priority over similar functions for Samos vehicles should conflict arise. Midas readout stations will be manned and operated by ADC personnel. ADC will plan for simultaneous Real-Time data display at both NORAD, COC and SAC Headquarters. + DC
>
> For CINCNORAD ADC will have operational responsibility for all Technical opeations commands which are given to the Midas satellite by SAC Control Center after Midas satellites are place in orbit by SAC.
>
> It is recognized that many factors are not known at this time. However, early approval by the Secretary of Defense of Air Force Concepts for the development, operations and support of these systems is necessary to realize the maximum benefits from the proposed assignment of these systems to the Air Force.

* Ibid.

ARDC had designated and organized the 6594th Test Wing at the Lockheed Missile and Space Division Facility, Palo Alto, California, effective 6 April 1959.

This can be omitted

R. F. Mettler of the Space Technology Laboratories furnished Major General O. J. Ritland, Commander, AFBMD, his opinion of operating concepts for military satellite systems on 2 November 1959. It was his opinion that the basic concept of turnover from AFBMD/BMC to SAC that was being used on the ballistic missiles might not be applicable at any time during the next three to five years for military space systems. Mettler further stated:*

> In the case of a reconnaissance or an early warning system, the transition from developmental to operational status will most likely be quite different from the case of a ballistic missile system. More specifically, operational information may actually be obtained on early developmental launches well before the development of the system is sufficiently complete to put a conventional "operational" label on it; conversely, even after a first useable configuration is developed for "operational" data-gathering, it seems almost certain that in this type of system, continued developmental improvements of a component or subsystem nature will be introduced on a "when-readu" basis to improve the quality of the data being obtained. In other words, I would question that the stable situation in which a specific configuration is placed into orbit repeatedly over a long period of time will be encountered at any time during the next three to five years. Also, since the same launch pads will undoubtedly be used for launching both ~~operationa-~~ satellites intended to obtain "operational" information, it seems questionable to me that one would in an operational satellite system necessarily ever wish to turn the launching facilities over to SAC in exactly the same fashion that launching facilities are turned over to SAC for ballistic missiles.
>
> Perhaps the concept should be more nearly shaped as follows: imagine that the "turnover" point from AFBMD/BMC to SAC is shifted to a point in orbit after certain prescribed tests have been performed on it by AFBMD and/or appropriate contractors. If the satellite is operating properly, it would be turned over to SAC, who would then command that particular satellite on and off as required and would operate the readout stations. However, if after the satellite is

> placed into orbit, AFBMD determined that it was not operating properly, then the satellite would not be turned ~~efve~~ over to SAC, but would instead be used by AFBMD for Developmental purposes--such as programming it through special tests to diagnose the cause of the difficulty.

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x IOC from R. F. Mettler, STL, to MajGen O. J. Ritland, 2 Nov 59, subj: Operating Concepts for Military Satellite Systems.

Prior to a coordination conference to be held at AFBMD 9-13 November 1959, AFBMD furnished the Strategic Air Command, Air Defense Command and Air Materiel Command ground rules, assumptions and proposals for guidance and use in preparing for the conference. ~~The-schedules-were-based-on-slippage---~~ ~~Dates-furnished-were-~~ Schedules furnished for turnover of personnel, facilities and flight schedules for first launches ~~of~~ for primary purposes of gathering intelligence data by payload were generally in 1962 and 1963. The Strategic Air Command reply to Headquarters USAF concerning AFBMD's ~~the~~ proposal ~~was that-the-proposals~~ that included the following:

> The proposals made in this AFBMD message are completely contradictory to all esixting directives and guidance contained in an Air Staff correspondence to get the Samos System operational under SAC, as soon as possible, and in any event not later than October 1961. In addition, this new AFBMD proposal is in disagreement with the AFBMD Development Plan for Samos dated 30 Jan 59 and which was revalidated by AFBMD on 13 October-195---a 59. . . .It is to be especially noted that the AFBMD proposal, although calling for an incremental turnover to SAC of various future dates, all of which are much later than previously reflected in Air Staff guidanse and AFBMD Development plans, never does turn over the TOCC [Technical Operations Control Center, Offutt, AFB] or control function to SAC. The severe slippages proposed by AFBMD at this late date will, if accepted, seriously jeopardize current USAF endeavors to have DOD assign SAMOS and MIDAS to

SAC and

> SAC and ADC respectively, to say nothing of the national importance of obtaining an operational capability as soon as possible. . . . With regards to the proposed meeting at Inglewood 9-13 Nov 59, sponsored by AFBMD in order to coordinate the plans of the various commands associated with Samos and Midas, the SAC Operational Plan for Samos is written, based on Air Staff Guidance and previously agreed effectivity dates with AFBMD to turn over Samos facilities to SAC not later than October 1961. In this connection the SAC Operational Plan for Samos as briefed to the SAMOS WSPO at Inglewood during week of 21 Dep 59. The SAC Operational Plan for Samos is ready for inter-command coordination prior to submitting to USAF on 23 Nov 59. The SAC plan does provide for continued R&D on Satellite vehicles after October 1961 through coordinated scheduling. . . . In view of the above, the SAC Ops Plan for Samos will not be changed unless directed otherwise by Hq USAF.

On 17 November, The Secretary of Defense transferred the Samos development program to the Department of the Air Force with the understanding that the program would be conducted essentially in accordance with the current ARPA plans pending approval of an Air Force development plan to be submitted to the Director of Defense Research and Engineering by 15 January 1960. The Secretary of Defense requested that the revised development plan emphasize physical recovery and provide the initial launch of a recoverable payload well in advance of the present schedule (early FY '62). The Secretary further requested that additional steps beyond the current ARPA development plan toward the achievement of other objectives in

- does not require "after that"

ARPA-develo

Samos program and that steps beyond the research and development phase be held in abeyance pending specific pending specific approval from my office. . . . It is also understood that the Air Force will submit to me by 15 January 1960,/. . . ~~in accordance with the referenced memorandum~~, an operational plan for the SAMOS system including details of user relationships.[x]

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[x] SOD Memorandum for the Secretary of the Air Force, 17 Nov 59, subj: Transfer of the SAMOS Development Program to the Department of the Air Force.

On 7 December 1959, Herbert F. York, Director of Defense Research and Engineering, in a Memorandum for the Secretary of the Air Force directed the following:

> . . .it is recommended that steps be taken ~~to~~ at the earliest possible date to stop the expenditure of funds for operational aspects of SAMOS. This would include the training of personnel, acquisition of land and new facilities, including the SAMOS aspects of the rehabilitation of the Martin Bomber Plant, Offutt AFB, all data links including the R&D data link from Vandenberg to Sunnyvale, operational launching facilities; operational data and materiel; as well as any equipment needed to process the R&D outputs in an ~~above~~ attempt to provide operational warning.
>
> In preparation of the revised development plan under the referenced memorandum, it has been requested that the program be reoriented. It is further recommended that ~~a~~ funds presently available for SAMOS be appropriately programmed to emphasize research and development in such a manner as to obtain proven feasibility and reliability of the system at an earlier date than now envisaged.

make a table

After being briefed by representatives from AFBMD on the impact of the budget ceiling FY 1960 and FY 1961 on the Samos and Midas programs, ~~the-Strategic-Air-Command~~General Power, SAC, instructed the SAC staff to re-examine the SAC stated requirements for the Samos/Midas systems with a view to possible relaxation of some of the stringent factors that could effect the early acquisition of vital intelligence. On 1 December The Strategic Air Command had requested AFBMD brief the Commander-in-Chief Strategic Air Command as soon as possible on the detailed plans for converting the Vandenberg Air Force Base Atlas 65-1 facilities to operational Samos launch facilities, ~~-AFBMD had-~~ and Samos and Midas Development Plans. The briefing was scheduled for 12 December ~~on-the-~~ at Headquarters SAC, at ARDC on 14 December for Development Plans, and on USAF on 16 December 1959 for Development Plans. Headquarters USAF later amended ~~briefingsthe-briefing-on-14-December~~ Stet briefing~~s-on-14-December-to-~~ to USAF on 14 December, to the Air Force Ballistic Missile Committee and to Air Staff on 16 December be informal reviews of the status of the Samos, and Midas Discoverer Programs for the purpose of obtaining policy guidance to assist AFBMD in the final preparation of development plans. For the purpose of review and approval of all development plans, operational plans and annexes, and logistical plans and annexes that applied to the three programs the briefings were scheduled for ~~January~~early January.

General Power was concerned over Samos and Midas developments after ~~the br~~ AFBMD briefed him on 12 December 1959. On 9-10 November AFBMD, SAC, ADC and USAF had agreed at the conference at AFBMD to an operational date of 1 July 1962 for Samos and 1 January 1963 for Midas. In addition the current budget would/caused cause ~~drastically cause the~~ slip in the agreed upon dates.[x]

In reply to ~~Ritland had answered~~ Mr. Mettler in regard to his ~~opinion~~ ~~in regard to his suggestions~~ opinions of turnover of the Samos and Midas programs to SAC by Ritland ~~replied that~~ informed Mettler that the ground rules mutually established with SAC and ADC, concerning the accomplishment of specified R&D objectives prior to turnover, would result in not turning the systems over until the basic configurations, facilities, and procedures were fairly well established and proven.[x]

This can be omitted except + move up

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[x] Msgs, SAC, To CofS USAF ~~to~~ ARDC VC 5540 and 5541, 14 Dec 59.

[x] AFBMD, WDZ, Ritland to Mr. Mettler, 4 Dec 59, subj: Operational Concept for Military Satellite Systems.

On 21 December 1959, Headquarters USAF (Development) issued a message pre- that provided guidance from Air Force Ballistic Missile Committee meetings 14 and 17 December on Discoverer, Samos and Midas programs. ~~The-funds--~~ New fund ceiling set was lower than the November ceiling by $4.6 Millions in FY 1960 and $5.6 Millions in FY 1961. AFBMD again protested the reduction on 31 December 1959 ~~and~~ but prepared new development plans in compliance with the new fund ceiling. ~~There-were-~~ All development plans were dated 15 January 1960 and included ~~Dis~~ plans for Discoverer, Midas and Samos ~~Samos-and-a-Samos~~ a Development/Operational Annex for both Midas and Samos. x

x add

Commander-in-Chief, Strategic Air Command protested the new fund ceilings established by the AFBMC to Generals Lemay and Griswold, Headquarters USAF and also protested ~~the~~ that AFBMD was planning on presenting a program, in keeping with the fund ceiling, and which AFBMD had entitled "minimum essential R&D Program," and noted that the program would lead to an operational program sometime in 1964. Power also noted

> In addition AFBMD will present another, slightly more costly, program which they have entitled "Developer/Operator Program." This latter Samos program would produce a subscale operation program ~~would-produce~~ in late 1963, versus a previously agreed to fully operational date of 1 July 1962.

> Both of these programs are, of course, unacceptable to SAC. In this connection reference is made to a message from General Power to General White, ~~Cite-6-0706~~ - - - dated 25 January 60, subject: "Principal problems of major commands."...Reference is made to AFDAT message ~~64965,~~ - - - dated 22 Janjary 60 which stated, "In addition to recommendations for Midas in accordance with actions directed in AFDAT 98212, it is requested that ARDC be prepared to discuss a program that would insure the earliest possible operational date for Midas assuming a 1 March 1960 go-ahead." ...In view of the above, AFDAT message and appreciating the technical interface between Samos and Midas and at the same time recognizing that the President had previously established a DX priority for Samos, it is requested that ARDC (AFBMD) be directed to also brief a Samos program that will permit a 1 July 1962 operational date. It is again recommended that the AFBMC, during its 10 February 60 meeting on this subject, fund for an operational date of 1 July 62 for Samos and 1 January 63 for Midas.

The Commander-in-Chief, SAC also requested that SAC representation at the 3 February 1960 Weapons Board Meeting and the 10 February 1960 AFBMC Meeting ~~on-the-subject-of~~-- to be held on the Discoverer, Midas and Samos development plans problems.x

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x Msg, CINCSAC Offutt AFB, to Hq USAF, Info ARDC, 28 Jan 60.

On 30 December 1959, Commander-in-Chief, Strategic Air Command ~~again-se--sent-another-message-~~ forwarded another message to Andrews ARDC, ~~reeemmendin--~~ in which he recommended that sp. indent any thought of further ~~slippa~~ slipping Samos and Midas is inconceivable in light of the requirement for warning generated by the missile threat. Therefore, the Air Staff should provide the monies required to obtain an operational Samos program on 1 July 1962 and an operational Midas program on 1 January 1963, even at the expense of other programs. end

General Power recommended that former SAC requirements be modified so as to use current WS 117L facilities but that product improvement should be examined for Samos and Midas, at the Denver Facility and that the facility should be terminated as soon as the Data Processing Facility became functional at Offutt AFB.

On 4 January 1960, General Francis Griswold, SAC Headquarters, sent another message to Chief of Staff USAF ~~warning~~ giving the basic SAC position ~~was~~ is "warning is everyone's business" and that any further slippage in the operational dates for Samos and Midas could very well jeopardize national security.

On 4 January 1960, ADC forwarded a message to AFBMD that contained the following ADC views: x

> . . . certain instructions based on reduced FY 60 & . . 61 funding for these programs were received whereby delivery of plans was delayed, and it now appears that Midas/Samos Programs will be severly delayed in the R&D phase and that negligible funding is planned in FY 60 and 61 for implementing the operational phase. . . . In view of the urgent need for the several excellent military advantages to be gained by Midas/Samos this command is gravely converned over any actions that would delay gaining the earliest possible operational capability for these systems. This command is fully cognizant that both systems are demanding much of the state-of-the-art in their development. However, it is believed that both the development and operational programs should proceed currently and both be adequately funded so the heretofore planned operational dates can be realized. Failure to proceed concurrently will delay essential USAF aerospace capability....Your reduction in funding and attendant program slow down appears to be a change in urgency for attaining Midas/Samos operational capability. However this Hq has received no message specifically stating a change of urgency. Therefore, request you advise this Hq on following questions:
>
> First, has there been a directed change in Midas/Samos program urgency? If so, what were the considerations and basis for the decision?
>
> Second, what action is being taken to provide adequate funding for concurrent pursual of developmental and operational programs/
>
> Third, what change of action is expected of ADC in view of the reduced funding directives sent to ARDC by Hq USAF?

In a message ~~[illegible]~~ to Chief of Staff dated ~~On~~ 17 November, AFBMD had protested the reduction in funds with info to ~~to Chief of Staff, USAF~~, and as well as ~~on~~ placing major emphasis on the recovery program at the expense of the readout program, and had forwarded information copies to Air Defense Command, ARDC, Strategic Air Command, and Air Material Command.

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x Msg, ADC to ~~AFBMD, 4-Jan-60,~~ ADLPD-D-1, 4 Jan 60.

This was much later

~~made distribution of its~~ ~~completed [illegible] draft Headquarters~~ USAF Preliminary Operational Concept ~~dated 23 December 1958.--A few weeks [illegible] About a month [illegible]~~ Before [illegible] can [illegible]

~~date of the [illegible] concept,~~ Under Secretary of the Air Force, Malcolm

17 November
A. MacIntyre had written his/Memorandum for the Director of ARPA dated 17- about the Air Force understanding of the NASA/Air Force agreed upon approved p- re-defined WS 117L program, in which he included the retention of "the basic center established at or near Offutt AFB will be operated by ARDC." ~~The center at Offutt AFB was a facility General Thomas D. Power, Commander of Strategic Air Command, Offutt Air Force Base, Nebraska, wanted established for operational purposes. Until [illegible] General Power had been commander of ARDC from 15 April 1954 to 30 June 1957. [illegible]~~

On 4 December 1958 Director of NASA, Roy W. Johnson, in a memorandum for the Under Secretary of the Air Force, agreed that the "tentative basic center to be established at or near Offutt Air Force Base at some future date, and any related centers pertinent to the program, will be operated by ARDC."

On 15 February 1960 Headquarters USAF (Assistant for Advanced Technology) notified ARDC & AFBMD that the AFBMC approved the development plans for Discoverer, Samos and Midas dated 15 January 1960, including the minimum essential research and development programs and the development/operations add-ons for Samos and Midas, ~~However~~ but that implementation of the plans had to await approval of DDR&D.[x]

this should be
for Samos only
in line the plan ~~detailed~~ operational/operation
or something,

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[x] Msg, AFDAT 70703, 15 Feb 1960.

In Memorandum for the Secretary of the Air Force, 20 April 1960, Herbert F. York, Director of DDR&E, noted that the plans were submitted on the basis that ~~there~~ only funds in amount of $262.4 million for FY 1960 and [redacted] FY 1961 were available, but that an additional funds in amounts of $20.6 million for Midas and $5.0 million for Discoverer were required. ~~The amounts~~ Additional amounts required for ~~19~~ FY 1961 were involved in the Air Force reprogramming proposal pending before Congress and actual funding could not be determined through usual fiscal channels. However the Research and Development plans were approved ~~in principle~~ to include additional required Air Force required ~~funds as follows:~~ ~~[illegible]~~ funds for FY 1960, and ~~and~~ AF required funds ~~for~~ FY 1961 in principle, as follows:

Change this for Samos only or
label chapter Operational aspects
or
something

	FY 1960
Midas	$ 51.9
Discoverer	$ 76.1
Samos	$160.0
	$288.0

[redacted]

There was no approval of construction funds, which were to be handled separately.[x]

On 1 June Deputy Chief of Staff/Development, USAF, ~~in a letter,~~ directed ARDC /~~asked~~/~~for that~~ to ~~the Samos--~~ a revised Samos and Midas/Development Plans ~~be prepared~~ and/to ~~submitted~~ ~~tuem~~ them as soon as possible and specified ground rules to be used in revising the plan. ~~Reasons given~~. The Under Secretary of the Air Force/had directed ~~on~~ on 27 May 1960 that the Research and development exploitation and operational plans for Samos be re-evaluated. Questions of operational command, operational facilities and user relationships for the Samos ~~reconna-~~ had continued to be matters of considerable discussion. The Under Secretary of the Air Force had further stated ~~that there was considerable technical uncertainty as to the characet character and qualitity of the information that~~

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[x] Herbert F. York Memorandum for the SAF, 10 Apr 60.

he had noted that a very elaborate plan had been originally conceived for the operational control, data handling, data utilization, data volume, and data display elements of the Samos and Midas operational systems, but that approval of the plan "with authorization for expenditure of funds had not been forthcoming."x The Under Secretary also questioned the desirability of former plans in connection with location of the operational capability and the CINCNORAD believed that Midas control, readout, display, etc., must be integrated in a common location with other defense subsystem elements.x ibid

ARDC Vice Commander Major General James Ferguson interpreted ~~the instructio~~ ~~ground-rules-~~ the new directions ~~to--mean-that-his-command-~~ pertaining to the location of the proposed Samos capability as a relief from the provisions of ~~the~~ General Curtis E. LeMay's letter of 5 August 1959.x

On 16 June General Power ~~protested--~~ made his second protest to ~~General-In-~~ Chief of Staff, USAF, General Thomas D. White, ~~within-a-month's~~ within a month's time. General Power insisted ~~that-data-handling-should-be-co-located-with-the-operational-control-for-efficiency-of-operation--~~ an interim data processing capability should be installed in the existing facilities on Offutt AFB, and that the facility was required in conjunction with the very first ~~R&~~ research and development launch.

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x Ltr, USAF (AFDSD-AT), 1 Jun 60, Subj: Exploitation of Initial Samos Data.

x Ltr, Hq ARDC (RDY), 14 Jun 60, subj: Exploitation of Initial Samos Data.

On 16 June 1960 wrote General Power

General White ~~s reply was that in part~~/was that it was his belief that the programmed launches represented an acceptable R&D program and ~~that~~ that the operational program,"both as to scope and timing, does not enjoy the same status." General White further ~~replied~~ wrote that sufficient opposition existed to the operational plans for Samos to preclude early approval, and that requirements at that time for construction of a 303,000 square foot facility at Offutt/was most frequently questioned inasmuch as there had been no/system demonstrated success.[x]

Thereafter /Headquarters USAF terminated movement of any Samos equipment ~~to~~ scheduled for installation in the ~~facilitys-at-Offutt--~~ facility ("Early-Fix") at Offutt AFB and cancelled the "Early-Fix" construction contract.[x]

On 24 June 1960, General Power made his third protest/by letter to Chief of Staff, USAF, General Thomas D. White within/about a month's time. General Power insisted that an interim data processing capability should be installed in the existing facilities on Offutt AFB, and that the facility was required in conjunction with the very first research and development launch.x add 1

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[x] Ltr, USAF- DAF (AFCCS), 16 Jun 60, to General Thomas S. Power, subj: Samos and Midas.

[x] Ltr, Gen Thomas S. Power, CINCSAC, toGen ~~Temas~~ Thomas D. White CofS USAF, ~~se~~ 24 Jun 60, no subj.

On 21 June 1960 Major General James H. Walsh, Assistant Chief of Staff, Intelligence, USAF, also protested ~~tyat~~ that the ~~Off~~ "Early-Fix" facility should be ~~prepared-for-~~ made ready for the ~~equipment~~ shipment of R&D data processing equipment scheduled for shipment to Offutt AFB on or about 31 March 1961. In June 1957 Major General Walsh ~~had~~ and his staff had favorably endorsed the eventual assigment of WS 117L to Strategic Air Command.x On 24 June 1960, General Walsh wrote Deputy Chief of Staff, Development, USAF, in less demanding terms than theretofore and ~~agreed~~ noted that "Operational considerations pertaining add 2

ADD. ~~on [illegible] 1960~~ on 24 June 1960 General Power also wrote Lieutenant General Bernard A. Schriever, Commander, ARDC, about his concern over the data processing facility and recommended a proposal to make use of ~~pre~~ his ~~present~~ "present" facilities at Offutt AFB to solve his immediate problem, "followed by a phased build-up of an austere R & D test facility here at Offutt. In the meantime, however, the Intelligence people in SAC Headquarters had planned to leave for Washington early the following Monday morning to present the Strategic Air Command's position to Headquarters USAF. ~~The~~ the SAC position ~~is going~~ was to

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xLtrs, HqSAC, Gen Power to Gen Thomas D. White, CofS USAF, 16 Jun 60, and 24 Jun 60.(Gen Power's letter of 16 Jun 60 refers to his letter of 21 May 60.)

x, Ltr, DAF (AFCIN) MajGen James H. Walsh to AFORQ (Gen S'ith) 21 Jun 60 subj: Letter of Nonconcurrence; ~~Mary~~ Col Frederic C. E. Oder Memo to Colonel Terhune, WDT, 25 Jun 57, subj: WS 117L Preliminary Operational Concept.

~~strait-to~~ straight to Headquarters USAF instead of ~~to go~~ "to go the route of collaborating with AFBMD and then going in with a minority opinion."x

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x Ltr, Hq SAC (SAC/MIKE), Col John F. Batjer to Major Spindler, 24 Jun 60, subj: SAMOS.

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end of add 1

ADD 2

to SAMOS and MIDAS become intermingled with the development programs."

He considered the "old Martin Bomber Plant" an "acceptable site for ~~this~~ construction of a facility for test of Subsystem I in the operational "environment with appropriate intelligence source material." Walsh urged that the development

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x Ltr, AFCIN, MajGen James H. Walsh, Asst ~~Chief~~ CofS, Intelligence, 24 Jun 60, subj: SAMOS.

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of Samos and Midas be pursued with the utmost vigor to assure at least an interim capability not later than September 1960."xx

end of add 2

On 29 June General White wrote General Power and referred to Power's several letters, and especially two dated 16 and 24 June 1960. General ~~Wal~~ White wrote he fully appreciated and completely understood ~~his~~ Power's deep and continued concern with "regard to the lack of clear-cut definition and steadfast pursuit of the SAMOS program." General White further wrote he would like General Power ~~the~~ "to appreciate and fully understand that there are problems other than operational which I face in this program."

General White ~~[illegible]~~ felt that it was essential that the Air Force operate the Samos, although ~~it did not ma~~ that would not make the Air Force sole exploiter of the "resulting intelligence material, and that in his"view,'operate' consists of launch, injection, command and control on orbit, data retrieval, data reproduction as required, and dissemination of this new data to designated users." It was General White's opinion that the revised development plan that ~~is~~ was ~~was~~ to be presented to ~~this~~ USAF headquarters early in July, if completely responsive to ~~the above~~ guidance furnished in his letter General White attached to his letter would ~~will~~ get SAMOS off dead center and on to a stable track. "Supplemental Hq [illegible] USAF Guidance to ARDC, SAC and ADC Concerning Samos."x ~~It~~ General White mentioned ~~As to~~ wrote that "In my judgment, the plan requested in General Wilson's 1 June 1960 letter, and the additional guidance provided herewith in the attachment to this letter, adequately defined the scope of the best SAMOS program which we can sell."

Some of the ~~Problems~~ problems other than operational problems General White faced in the Samos program, ~~[illegible]~~: though they may not have been the problems General White had in mind, not limited to are as follows:

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x Ltr, DAF (AFCCS) Gen White to Gen Power CICSAC, 29 Jun 60, subj: SAMOS.

general   add [illegible] updates

On 31 August 1960, Secretary of the Air Force Dudley C. Sharp issued Secretary of the Air Force Order No. 115.1 . . establishing the Office of Missile and Satellite Systems in the Office of the Secretary of the Air Force with primary responsible for assisting the Secretary in "discharging his responsibility for the direction, supervision and control of the SAMOS Project."[x] Effective the same date, Secretary Sharp designated Brigadier General Robert E. Greer, Assistant Chief of Staff for Guided Missiles, Director of the SAMOS Project, with additional duty as Vice Commander for Satellite Systems, Air Force Ballistic Missile Division, ARDC, with duty station at 2400 East El Segundo Boulevard, El Segundo, California."[x]

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[x] SAF Order 115.1, 31 Aug 60.

[x] ~~Secretary-of-t~~ SAF Order No. 116.1, 31 August 1960.

~~The 6594th Launch Squadron and the 6596th~~ Instrumentation ~~Squadron,[*] Vandenberg Air Force Base, launched~~ ~~The first [illegible] [illegible]~~ the first SAMOS vehicle was launched ~~with~~ with an Atlas booster as the first stage on 11 October 1960 from Point Arguello. Damage to the satellite vehicle during launch when an umbilical failed to release properly, resulted in failure of the upper stage.[x]

~~* Designated and organized by GO No. 40, ARDC, 6 May 59.~~

~~* Designated and organized by GO No. 54, ARDC, 17 Jun 59.~~

3 [illegible]

DOCUMENT HISTORY OF SAMOS

1. Msg, WDG-5-6-E, 132330Z May 55.
2. Report of the Scientific Advisory Board Reconnaissance Panel on Reconnaissance from Satellite Vehicles, 28 May 56 (C/Gp3)
3. Msg, WDTR 9-1-E, 5 Sep 56.
4. Memorandum for Colonel Terhune (C/Gp3), LtCol Frederic C. E. Oder, subj: Report of Trip 18-21 September 1956, 27 Sep 56, w/atch.
5. Ltr, The Ramo-Wooldridge Corporation to LtCol F. C. E. Oder, subj: R-W Computer Developments, 8 Oct 56.
6. MFR, LtCol Quenten A. Riepe, subj: Operational Concept for WS 117L, 8 Oct 56.
7. Ltr (C/Gp3), LtCol Frederic C. E. Oder, thru AFPR Lockheed Aircraft Corp to Lockheed Aircraft Corporation, subj: Briefing on Advanced Electronic Ferret Reconnaissance System, 12 Oct 56.
8. DF, WDTR to WDO, Attn: Major Schiavo, subj: Briefing on Advanced Electronic Ferret Reconnaissance System, 12 Oct 56.
9. DF, WDTR to WDT, subj: Briefing on Advanced Dlectronic Ferret Reconnaissance System, 12 Oct 56.
10. Ltr (C/Gp3), LtCol Frederic C. E. Oder thru AFPRO to Lockheed Aircraft Corporation, subj: Use of Light Amplification Techniques in the Visual Reconnaissance Subsystem of WS 117L, 15 Oct 56.
11. Msg (C/Gp3), WDTR 10-6, 24 Oct 56.
12. Memo for Col Terhune and Gen Ritland (C/Gp3), subj: Reconnaissance Symposium at Fairchild Camera and Instrument Corporation, 29 Oct 56.
13. Ltr (C/Gp3), Simon Ramo, Executive VP Ramo-Wooldridge Corp, no subj, 29 Oct 56.
14. DF (C/Gp3), WDTR to WDO and WDT, subj: Operational Concept for WS 117L, 9 Nov 56.
15. MRS (DD Form 95), undated relating to above subject.

16. MRS (DD Form 95), Col Robert D. Bowers to Col Sheppard, 9 Nov 56.

17. Memo for Col Terhune, WDT (C/Gp3), Col William A. Sheppard, WDO, subj: Operational Concept for WS 117L, 14 Nov 56.

18. Excerpts from Committee Reports NAS-ARDC Study Group on Research and Development Objectives For the United States Air Force (C/Gp3), 1957.

19. Memorandum for Colonel Terhune (C/Gp3), from MajGen B. A. Schriever, subj: ARS, 4 Feb 57.

20. DF (C/Gp3), WDTR to WDT and WDG, subj: Intelligence Data Handling System Support for WS-117L, 20 Feb 57.

21. Memo for Col Terhune (C/Gp3), from Col Frederic C. E. Oder, subj: Contractor Competition - WS 117L, 26 Feb 57.

22. Memo for Colonel Terhune from Col Frederic C. E. Oder, subj: Proposal for WDD Management of 438L, 8 Mar 57.

23. DD Form 613 (C/Gp3), RDB Project Card, Short Title: VRSFARS117L, 2 Apr 57.

24. DD Form 613 (C/Gp3), RDB Project Card, Short Title: ERSSFARS, WS 117L, 2 Apr 57.

25. DD Form 613 (C/Gp3), RDB Project Card, Data Processing Subsystem for ARS, WS 117L, 2 Apr 57.

26. Ltr (C/Gp3), Brig Gen O. J. Ritland to MajGen H. H. Estes, Jr, Asst DC/Weapon System Detchment #1, Hq ARDC, Wright-Patterson AFB, subj: Coordination of WS-117L and WS-438L Intelligence Data Handling Functions, 26 Apr 57.

27. dupe -omitted

28. DF, WDTO to MCPTF, Mr. Rossbo, subj: Approval of a Feasigility Study, ca 1 May 57, w/1 Incl: Draft Statement of Work.

29. Memorandum for Col Terhune (C/Gp3), WDTR, subj: Preparation of Preliminary Operational Concept for WS 117L, 23 May 57.

30. Feasibility of Scientific Uses of IRBM and ICBM, Part 1, Summary of the Study, 3 Jun 57.

31. Memo to Col Terhune, WDT, (C/Gp3), from Col Frederic C. E. Oder, signed Quenten A. Riepe, subj: WS 117L Preliminary Operational Concept, 25 Jun 57.

32. Ltr, WDTR to BrigGen Donald P. Graul, Comdr RADC, no subj, 5 Sep 57.

33. Memo for WDT from WDGE, Col J. L. Hamilton, subj: Visit by Brigadier General Donald P. Graul, Comdr, RADC, 16 Sep 57.

34. Msg, WDTR 10-15, 15 Oct 57.

35. Msg, RCK-1-47#, 1020407 Jan 58.

36. Ltr, RADC, BrigGen D. P. Graul, to Director of Procurement, RADC, subj: Source Selection, WS 117L, Subsystem I, 11 Jan 58.

37. Memorandum to General Schriever (C/Gp3), from WDTR sgd Col Charles H. Terhune, Jr, subj: Selection of Prime Contractor for Data Processing Subsystem, WS 117L, 15 Jan 58.

38. Msg, WDTR 1-6-E, 15 Jan 58.

39. Memo for Deputy Comdr, Weapon Systems, sgd Col J. L. Hamilton, subj: Survey of Research and Development in Support of USAF Intelligence and Reconnaissance Functions, 23 Jan 58, w/1 Incl: Ltr from Office of IG, USAF, Norton AFB, California, to Comdr, ARDC, same subj, undated.

40. DF, WDTR to WDT, WDGE, WDGA and WDSI, subj: Survey of Research and Development of USAF Intelligence and Reconnaissance Functions, 31 Jan 58.

41. Memo to General Schriever (C/Gp3), WDTR, sgd Col Charles H. Terhune, Jr, subj: Status of Prime Contractor Selection for WS 117L Data Processing Subsystem, 3 Feb 58.

42. Memorandum for Col Terhune, WDTR, sgd Col Frederic C. E. Oder, subj: R-W Participation in WS 117L, 14 Feb 58.

43. Memo for General Schriever (C/Gp3), WDTR, sgd Col Frederic C. E. Oder, subj: Preliminary Evaluation of ITEK Proposal, 18 Feb 58.

44. Memo for Col Leonard (C/Gp3), WDTR, sgd BrigGen O. J. Ritland, subj: Air Technical Information Center (AFCIN-4) Requirements in Support of WD 117L, 19 Feb 58.

45. Memo to Gen Ritland - WDGV, WDTR, sgd Col Charles H. Terhune, Jr, subj: Status of ARSIC Planning, 26 Feb 58.

46. DF (C/Gp3), MCPTA to MCPT, subj: Weekly Diary - 21 thru 27 Feb 1958, 27 Feb 58.

47. Ltr, WDIR, sgd BrigGen O. J. Ritland, subj: Request for Technical Intelligence Read-out and Processing Support for WS 117L, 25 Mar 58.

48. Weapon System 117L Program Status Report (C/Gp3), As of 15 Apr 58.

49. Weapon System 117L Program Status Report (C/Gp3), As of 15 May 58.

50. Memo for Gen Schriever (C/Gp3), WDTSRF, sgd Col Charles H. Terhune, Jr, subj: Status of Advanced Reconnaissance Systems Intelligence Center Planning, 30 Apr 58.

51. Weapon System 117L Program Status Report (C/Gp3), for Period 15 April to 31 May 1958.

52. Msg (C/Gp3),, WDTSR 6-17-E, 13 Jun 58.

53. Memo for Colonel Sheppard, WDGO (C/Gp3), WDI, sgd Col William E. Leonard, subj: Operating Agency for WS 117L, 26 Jun 58.

54. Weapon System 117L Program Status Report (C/Gp3), For Quarter Ending 30 Jun 58.

55. Msg (C/Gp3), WDGO-6-4, 020039Z Jul 58.

56. MFR (C/Gp3), WDG, sgd MajGen B. A. Schriever, subj: Operational Planning for WS-117L, 2 Jul 58.

57. Msg (C/Gp3), AFOOP-OC-R 53126, 102050Z Jul 58.

58. Ltr, WDTSR, sgd BrigGen O. J. Ritland, subj: Preliminary Operational Concept WS 117L, 15 Jul 58.

59. Msg (C/Gp3), WDTSR 7-25-E, 25 Jul 58.

60. Planning Document (C/Gp3), Draft by LtCol Schuyler, 28 Jul 58.

61 Weapon System 117L Program Status Report (C/Gp3), For Month Ending 31 Jul 58.

62 Memo for Colonel Curtin (C/Gp3), WDG, sgd MajGen B. A. Schriever, subj: WS-117L R&D Operations at Cooke Air Force Base, 6 Aug 58.

63. Msg (C/Gp3), AFCGM 056133, 21212Z Aug 58.

64. Weapon System 117L Program Status Report (C/Gp3), For Month Ending 31 Aug 58.

65. Memo for General Large (C/Gp3), WDGO, sgd MajGen B. A. Schriever, subj: Changes in WS-117L Schedules, 12 Sep 58.

66. Msg (C/Gp3), RDZGA 9-13-E, 161545Z Sep 58.

67. Ltr (C/Gp3), WDTSR, Sgd Col J. L. Hamilton, subj: Release of WS 117L Information to Foreign Nationals, 26 Sep 58.

68. Weapon System 117L Program Status Report (C/Gp3), Quarter Ending 30 Sep 58.

69. Msg (C/Gp3), DEF 949420, 102109Z Oct 58.

70. Msg (C/Gp3), WDG-11-8-E, 11 Oct 58.

71. Msg (C/Gp3), WDPP-10-1-E, 22 Oct 58.

72. Msg, RDQGW-10-37-E, 232135Z Oct 58.

73. Sentry Program Status Report (S/Gp3), Month Ending 31 Oct 58.

74. Ltr (C/Gp3), WDQW, sgd MajGen B. A. Schriever, to Mr. Amron H. Katz, The RAND Corporation, no subj, 3 Dec 58.

75. Ltr (C/Gp3), WDZW, sgd MajGen B. A. Schriever to BrigGen Donald P. Graul, Comdr, RADC, no subj, 3 Dec 58.

76. Sentry Program Status Report (S/Gp3), for November 1958, 10 Dec 58.

77. Msg (C/Gp3), WDZW 12-25-E, 29 Dec 58.

78. Msg (C/Gp3, AFCIN 55022, 141543Z Jan 59.

79. ARPA Order No. 9-58 Amend No. 7, 19 Jan 59. (ARPA Order No. 9-58 and Amendments Nos 1 to 6 are contained in Document Volume I-1-3.)

80. Ltr (C/Gp3), WDZW, sgd Col Richard D. Curtin for MajGen B. A. Schriever, to Asst CofS for Guided Missiles, Hq USAF, subj: WS 117L Program, 28 Jan 59.

81. Ltr (C/Gp3), WDZW, sgd Col Richard D. Curtin for MajGen B. A. Schriever, to Comdr ARDC, subj: WS 117L Program, 30 Jan 59.

82. Msg (S/Gp3), AFCGM T. S. 3665, 051915Z Feb 59.

83. DOD Directive No. 5129.1, 10 Feb 59.

84. Ltr (C/Gp3), WDZW, sgd BrigGen O. J. Ritland, to Asst CofS for Guided Missiles, Hq USAF, subj: WS 117L Program, 11 Feb 59.

85. Ltr (C/Gp3), WDZW, sgd BrigGen C. J. Ritland, to Comdr ARDC, subj: WS 117L Program, 11 Feb 59.

86. Memorandum for the Secretary of the Air Force (C/Gp3), ARPA, sgd Roy W. Johnson, Director, subj: Policy Relating to the Official Identification of Projects DISCOVERER, SENTRY, and MIDAS, 12 Feb 59.

87. Ltr, AMC (SMAMA), sgd MajGen George E. Price, to Comdr AMC, subj: Support of Space Programs, 13 Feb 59.

88. Memorandum for the Commander, AFBMD, from ARPA, sgd Roy W. Johnson, subj: Status Report on Discoverer, Sentry and Midas Programs, 13 Feb 59.

89. ARPA Order No. 9-58 Amend No. 8, 15 Feb 59.

90. MFR, WDGE, subj: Call from Colonel Hart to Colonel Hamilton, 17 Feb 59.

91. Memo to WDZW, Sgd R. D. Curtin, subj: ARPA Memos Attached, 17 Feb 59. (See Memo from ARPA, 13 Feb 59.)

92. Msg, RDZCW-20-2-36-E, 201932Z Feb 59.

93. Msg (C/Gp3), WDZW-2-17-E, 26 Feb 59.

94. Ltr (Uncl w/o Incl), WDZWS, sgd Brig Gen Ritland, to MajGen H. E. Watson, Dep Asst CofS for Intelligence, no subj: 27 Feb 59, w/1 Incl: WDZWS Memo for Gen Ritland (C/Gp3), 19 Feb 59.

95. Ltr, WDZWS sgd BrigGen Ritland, to Lockheed Aircraft Corporation, subj: Summary of AFBMD Review of WS 11yL Drafting Practices, 17 Mar 59.

96. DOD Directive No. 5105.15 (FOUO), 17 Mar 59.

97. Ltr, WDG, sgd MajGen B. A. Schriever, to Comdr 1st Missile Division, subj: Support Requirements for the Sentry Program, 19 Mar 59.

98. Ltr (C/Gp3), AFDAT, sgd BrigGen H. A. Boushey, to Comdr, AFBMD, subj: Management of Sentry, 25 Mar 59.

99. DF, LBJ to LBG-2, subj: Weekly Diary - 2C thru 26 Mar 59, 26 Mar 59.

100. ARPA Order No. 9-58 Amend No. 9 (C/Gp3), 1 Apr 59.

101. Msg (C/Gp3), WDZW-3-32-E, 1 Apr 59.

102. ARPA Order No. 9-58 Amend No. 10 (C/Gp3), 3 Apr 59.

103. Memorandum for Deputies, Directors and Chiefs of Comparable Offices, from DAF, sgd MajGen Jacob E. Smart, subj: Responsibility for Space Projects, 6 Apr 59.

104. Ltr (C/Gp3), Hq 1st Missile Div, sgd MajGen David Wade, to AFBMD, subj: Support Requirements for the Sentry Program, ca 13 Apt 59.

105. ARPA Order No. 9-58 Amend No. 11 (C/Gp3), 14 Apr 59.

106. Sentry Monthly Program Progress Report (C/Gp3), 8 May 59.

107. Memo for the Secretary of the Air Force (C/Gp3), ARPA, sgd Roy W. Johnson, subj: ARPA Prder No. 9-58, SENTRY Project, 25 May 59.

108. Msg (C/Gp3), RDQGW-26-5-43E, 262100Z May 59.

109. Msg (C/Gp3), WDZW-5-31E, 28 May 59.

110. Msg (C/Gp3), AFCGM 51490, 291417Z May 59.

111. Msg (C/Gp3), AFDAT 52070, 052042Z Jun 59.

112. Ltr (S/Gp3), WDPCR, sgd BrigGen O. J. Ritland, to Director, ARPA, subj: SENTRY Monthly Program Progress Report, 31 May 59, 8 Jun 59.

113. Msg (S/Gp3), RDRCR-12-6-61-E, 122050Z Jun 59.

114. Msg (S/Gp3), WCG 30685-E, 121400Z Jun 59.

115. GO No. 54 ARDC 17 Jun 59.

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118. Ltr (S/Gp3), WDZWP, sgd MajGen O. J. Ritland to Hq USAF (AFDAT), subj: Transmittal of Development Plans, 18 Jul 59.

119. Ltr (S/Gp3), WDZWT, sgd Col Richard D. Curtin, to ARDC (RDZGW, Col Worthman, subj: Short Title: SRP, 18 Jul 59.

120. MFR (FAFEO), sgd LtCol George H. Mathews, subj: Telecon between Colonel Wikstrom and Lt Colonel Mathews this office, 24 Jul 59.

121. ARPA Order No. 9-60 Amend No. 13, 30 Jul 59.

122. MFR, WDG , subj: Telephone Call from General Schriever to General Ritland, 31 Jul 59.

123. Msg (S/Gp3), WDZGWG-31-7-38-E, 311800Z Jul 59.

124. Ltr (S/Gp3), ARDC, sgd LtGen B. A. Schriever, to General Thomas D. White, CofS, USAF, no subj, 1 Aug 59.

125. Ltr (S/Gp3), DAF, sgd Gen Curtis E. Lemay, to Comdr, ARDC, subj: Assignment of Operational Planning Responsibility, 5 Aug 59.

126. Msg (C/Gp3), DEP 963459, 070824Z Aug 59.

127. Ltr (S/Gp3), WDPCR, sgd Col Frederic C. E. Oder for MajGen O. J. Ritland, to Director, ARPA, subj: SENTRY Program Progress Report for the Month of July 1959, 7 Aug 59.

128. Msg (C/Gp3), AFXPD-PL 63506, 132029Z Aug 59.

129. Ltr, WDZ, sgd MajGen O. J. Ritland to BrigGen D. P. Graul, Comdr, RADC, subj: Assignment of Personnel at Denver Colorado, 17 Aug 59.

130. Msg (S/Gp3), WDI-8-8-E, 19 Aug 59.

131. Ltr (S/Gp3), WDZSO, sgd Col Harry L. Evans, to AC /SAC MIKE/, subj: Interpretation of 5 August Letter from Vice Chief of Staff, 20 Aug 59. w/1 Atch: Sentry Operational Planning Procedures (S/Gp3)

132. Ltr (S/Gp3), DPL, sgd MajGen Charles B. Westover, to SAC MIKE, subj: Assignment of Operational Planning Responsibility, 21 Aug 59.

133. ARPA Order No. 9-60 Amend No. 14, 27 Aug 59.

134. Ltr (S/Gp3), DSSP, sgd Col John F. Batjer, subj: Interpretation of Letter from Vice Chief of Staff, 3 Sep 59.

135. SAMOS Program Progress Report as of 31 Aug 1959 (S/Gp3), 8 Sep 59.

136. Msg (S/Gp3), DEF 964914 from ARPA, 042209Z Sep 59.

137. Memorandum for Secretary of Defense (C/Gp4), from DAF, no subj, 9 Sep 59, w/Atch 1 of 3 Atch: Memorandum for Secretary of the Air Force, (C/Gp4), subj: Transmittal of the Fiscal Year 1961 Budget Estimate, 9 Sep 59.

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141. Msg (S/Gp3), from CINCSAC, DPLBC 2477, 170031Z Sep 59.

142. Memorandum for The Chairman, Joint Chiefs of Staff (C/Gp4), subj: Coordination of Satellite and Space Vehicle Operations, 18 Sep 59.

143. Ltr (FOUO), from Hq USAF sgd Gen Curtis E. LeMay, to Comdr ARDC, subj: Air Force Responsibilities to Other Elements of the DOD for Space Systems, 21 Sep 59.

144. Agreement for Coordinated Peacetime Operation of the Pacific Missile Range, 22 Sep 59.

145. GO No. 207 ARDC 25 Sep 59.

146. ARDC Movement Order Nr 1, 4999th Data Processing Squadron, 30 Sep 59.

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148. Msg (S/Gp3), CINCSAC DPLB 2999, 302245Z Sep 59.

149. Msg (S/Gp3),fm Hq USAF AFDAT 78900, 021502Z Oct 59.

150. Msg (S/Gp3), fm Comdr ARDC RDZGW-2-10-4E, 022000Z Oct 59.

151. Msg (S/Gp3), Hq USAF AFDAT 80589, 072157Z Oct 59.

152. ARPA Order No. 9-60 Amendment No. 15, 8 Oct 59.

153. Msg (S/Gp3), WDZT-10-11-E, 16 Oct 59.

154. Msg (S/Gp3), fm Comdr ARDC to AFBMD, 211035Z Oct 59.

155. Msg (S/Gp3), fm Hq USAF, AFCGM 85157, 231458Z Oct 59.

156. Msg (S/Gp3), fm ARDC RDRRB-23-31-E, 231715Z Oct 59.

157. Mission Statement 6594th Test Wing (S/Gp3), AFBMD (ARDC), 26 Oct 59.

158. Interoffice Correspondence (C/Gp3), STL, R. F. Mettler to MajGen O. J. Ritland, subj: Operating Concepts for Military Satellite Systems, 2 Nov 59.

159. Msg (S/Gp3), WDZSO-11-1-E, 3 Nov 59.

160. MFR (S/Gp3), subj: SAMOS, MIDAS and DISCOVERER Programs, 6 Nov 59.

161. Msg (S/Gp3), fm CINCSAC, DPL 4298, 060010Z Nov 59.

162. Ltr (S/Gp3), AFBMD (WDPCR), to Director ARPA, subj: SAMOS Program Report, 31 Oct 59, 9 Nov 59.

163. ARDC Form 111, subj: Advanced Reconnaissance System, 13 Nov 59.

164. Memorandum for the Secretary of the Air Force (S/Gp3), SOD, subj: Transfer of the SAMSO Development Program to the Department of the Air Force, 17 Nov 59.

165. Msg (S/Gp3), WDZF-11-6-E, 17 Nov 59.

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171. Memorandum for the Secretary of the Air Force.(S/Gp3), subj: Intelligence System SAMOS, 7 Dec 59.

172. Ltr, WDZ, sgd MajGen O. J. Ritland to Mr. Donald W. Douglas, Jr, subj: Thor Boosters, 8 Dec 59.

173. Msg (C/Gp3), Fm Hq USAF, AFDAT 95614, 09009Z Dec 59.

174. Chronological Sequence of SAMOS Operational Employment Activities, (S/Gp3) 11 Dec 59.

175. Msg (S/Gp3), SAC Offutt AFB to CofS Hq USAF, VC 5540, 161725A Dec 59.

176. Msg (S/Gp3), SAF Offutt AFB to ARDC, VC 5541, 161725 Dec 59.

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179. Msg (S/Gp3), fm Hq USAF AFDAT 98212, 212141Z Dec 59.

180. Msg (S/Gp3), fm Hq USAF to SAC, AFCVC 98219, 212156Z Dec 59.

181. Msg (S/Gp3), fm CINCSAC, DPL 5919, 302300Z Dec 59.

182. Msg (S/Gp3), fm AFBMD to Hq ARDC, WDZP-12-14-E, 31 Dec 59.

183. Msg (S/Gp3), fm SAC to CofS, info: ARDC, VC 0206, 4 Jan 60.

184. Msg (S/Gp3), fm ADC to AFBMD, ADLPD-D-1, 041922Z Jan 60.

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188. Msg (S/Gp3), SAC to CofS USAF, VC 0706, 19 Jan 60.

189. Ltr, AFBMD (WDZ), to WDGV, subj: Visit of DOD Advisory Group on Electronics (Baker Committee), 27 Jan 60, w/o Atch 1 of 2 Atchs: Agenda.

190. Msg (S/Gp3), CINCSAC to Hq USAF, info: ARDC and AFBMD, VC 0847, 281620Z Jan 60.

191. Msg (S/Gp3), Hq USAF to Comdr ARDC, Info: Comdrs AFBMD, ADC, SAC, AMC, AFDAT 66936, 292335Z Jan 60.

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193. Msg (C/Gp3), fm AFBMD to CofS, info: ARDC, WDZY-1-6-E, 1 Feb 60.

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195. Msg (S/Gp3), fm Hq USAF, AFDAT 70703, 152057Z Feb 60.

196. Msg (S/Gp3), fm SAC MIKE to CINCSAC, DDG-2-1-E, 16 Feb 60.

197. Chronology (S/Gp3), 17 Feb 60.

198. Msg (S/Gp3), fm Hq USAF to AFBMD and ARDC, AFABF and AFDDP 73993, 271712Z Feb 60.

199. Ltr (S/Gp1), fm WDZ to ARDC, subj: Joint French - U. S. Military Satellite Project, 29 Feb 60.

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201. Status Report - SAMOS (S/Gp3), Mar 60.

202. Memorandum for the Secretary of the Air Force (S/Gp3), subj: Intelligence System SAMOS, Apr 60. /Written 7 Dec 59/

203. Current Status Report (S/Gp3), Apr 60.

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205. Memorandum for Secretary of the Air Force (S/Gp3), sgd Herbert F. York, subj:SAMOS, MIDAS and DISCOVERER Research and Development Programs and Development/Operational Plans for SAMOS and MIDAS Programs, 20 Apr 60.

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207. Msg (S/Gp3), fm AFBMD to ARDC, WDZY-4897, 24 May 60.

208. Ltr (S/Gp3), DAF (AFDST-AT) sgd LtGen Roscoe C. Wilson, subj: Exploitation of Initial SAMOS Data, 1 Jun 60.

209. Msg (S/Gp3), fm AFBMD to LMSD, Sunnyvale, Calif, WDZY-5271, 1 Jun 60.

210. Ltr (S/Gp3), ARDC (RDY), sgd MajGen James Ferguson, subj: Exploitation of Initial SAMOS Data, 14 Jun 60.

211. Briefing Charts - 1 June Guidance (Gen Wilson ltr).

212. Memorandum for Secretaries of the Army, Navy and the Air Force fm Secretary of Defense, subj: Coordination of Satellite and Space Vehicle Operations, 16 Jun 60.

213. Ltr (S/Gp3), fm CINCSAC to LtGen Bernard A. Schriever, Comdr ARDC, no subj, 16 Jun 60, w/1 Atch: CINCSAC Ltr to Gen Thomas D. White, 16 Jun 60.

214. Ltr (S/Gp3) fm USAF CofS Thomas D. White to Gen Thomas S. Power, CINCSAC, subj: SAMOS and MIDAS, 16 Jun 60.

215. Ltr (S/Gp3), fm Lockheed Aircraft Corp, to AFBMD, subj: Augmented Re-entry and Recovery Program, 20 Jun 60, w/1 Atch: Subcontract Work Statement, LMSD/362527.

216. Ltr (S/Gp3), AFCIN to AFORQ (Gen Smith), subj: Letter of Nonconcurrence, 21 Jun 60, w/o atchs.

217. Back-up Material for Secy Gates presentation to the President (S/Gp3), subj: SAMOS, 23 Jun 60.

218. Ltr (C/Gp4), SAC MIKE, AC, to Major Spindler, subj: SAMOS, 24 Jun 60.

219. Ltr (S/Gp3), sgd Gen Thomas S. Power, CinCSAC to Gen Thomas D. White, USAF CofS, no subj, 24 Jun 60.

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222. SSS (S/Gp3), fm AFDSD-AT, sgd John L. Martin, Jr, subj: SAMOS, 27 Jun 60, w/o Atchs.

223. Ltr (S/Gp3), sgd Col Lowell E. May, Chairman, Satellite Intelligence Requirement Committee to Secretary, United States Requirements Committee, subj: Transmittal of Intelligence Requirements for Satellite Reconnaissance Systems of which SAMOS is an Example, 29 Jun 60, w/1 Atch: Proposed letter of SOD.

224. Supplemental Hq USAF Guidance to ARDC, SAC and ADC Concerning SAMOS (S/Gp3), 29 Jun 60.

225. Ltr (S/Gp3), fm Hq USAF, Office of CofS, AFCCS, to Gen Thomas R. Power, CINCSAC, subj: SAMOS, 29 Jun 60.

226. Ltr (S/Gp3), Hq USAF, AFDSD-AT to Multiple Addresses, subj: SAMOS, 30 Jun 60, w/o Atchs.

227. Ltr (S/Gp3), Hq USAF, AFORQ-PN/Panel, to Reconnaissance Panel and SAMOS working Group Members, subj: Minutes of Joint Meeting of Reconnaissance Panel and SAMOS Working Group, 1 Jul 60, 1 Jul 60, w/4 Atchs of 5 Atchs: 1. Ltr fm Gen Wilson to ARDC, 1 Jun 60 (S); 2. Ltr fm Gen White to Gen Power, 29 Jun 60 (S); 3. Supplemental Guidance by Gen Strother (S); 4. Factors considered in Guidance Preparation (S).

228. Intelligence Requirements for Satellite Reconnaissance Systems of which SAMOS is an Example (S/Gp3), 5 Jul 60, w/o Atchs.

229. Ltr (S/Gp3), AFORQ-RN/Panel to Reconnaissance Panel and SAMOS Working Group Members, subj: Minutes of Joint Meeting of the Reconnaissance Panel and SAMOS Working Group, 6 Jul 60, 6 Jul 60.

230. Ltr (S/Gp3), AFORQ-RN/Panel to Reconnaissance Panel and SAMOS Working Group Members, subj: Minutes of Joint Meeting of the Reconnaissance Panel and SAMOS Working Group, 7 Jul 60, 11 Jul 60.

231. Msg (S/Gp3), fm Hq USAF to Comdr ARDC, info: Comdr AFBMD, 20 Jul 60.

232. Ltr, AFBMD (WDLPR-3, to WDLE-1, WDZ and WDG In Turn, subj: Request for Approval - PR-61-BMD-59, 25 Jul 60.

233. Ltr (S/Gp3), sgd Gen Thomas S. Power, to Gen Thomas D. White, CofS, subj: SAMOS, 26 Jul 60.

234. Special Order No. 540 AFBMD 27 Jul 60.

235. Ltr (S/Gp3), SAC MIKE (DSS, to WDZ, subj: SAMOS System Improvement, 29 Jul 60.

236. SO No. 562 AFBMD 4 Aug 60.

237. Ltr (C/Gp4), WDZ to Col Paul J. Heran, Chairma [illegible] ource Selection Board, E-6 SAMOS, 30 Jul 60.

238. Msg (S/Gp3), fm AFBMD to AFBMD Field Office, Patrick AFB, [illegible], 2 Aug 60.

239. Msg (S/Gp3), fm Hq AFBMD to 1st Msl Div, Vandenberg AFB, info: ARDC, WDLL 4-8-3, 4 Aug 60.

240. Msg (S/Gp3), fm Comdr, Hq AFBMD, to Comdr ARDC, WDG-6-8-20, 7 Aug 60.

241. Ltr, WDG to WDZ, subj: RAND Letter L-15001, w/1 Atch, Ltr RAND Corp, 29 Jul 60.

242. Ltr, WDG to Mr. Herschel J. Brown, VP and Gen Mgr, Lockheed Missile and Space Division, no subj, 10 Aug 60.

243. Ltr, AFBMD (WDZE), to WDA, subj Organizational Announcement, 10 Aug 60, w/2 Atch: 1. Symbol Listing for WDR, Space Security Reconnaissance; 2. Symbol Listing for WDZ, Space Programs.

244. SAMOS Launch Schedule Revisions (S/Gp3), 11 Aug Development Plan.

245. Ltr (FOUO), WDV to Col Evans (WDZ), subj: Issuance of RFP's on the SAMOS Second Source, 12 Aug 60, w/1 Atch: MFR, 12 Aug 60.

246. Ltr (C/Gp3), WDZ, sgd MajGen O. J. Ritland, to Dr. Ivan A. Getting, Pres, The Aerospace Corporation, subj: SAMOS Program, 12 Aug 60.

247. Ltr (S/Gp3), sgd Thomas D. White, CofS, to Gen Thomas S. Power, CINCSAC, subj: SAMOS, 17 Aug 60.

248. MFR (S/Gp3),AFARF-10, sgd Lewis C. Meyer, Ch, RD& Missile Div, Directorate of Budget, subj: SAMOS Revised Development Plan, 18 Aug 60.

249. MFR (S/Gp3), prepared by Maj. H. C. Howard, AFDSD, subj: SAMOS Management Plan, 22 Aug 60, w/1 Atch: Changes to the Current Status Report SAMOS.

250. Ltr, AFCCS to Deputies, Directors and Chiefs of Comparable Offices (No. 10), subj: Briefings for Individuals outside of the Executive Branch of the Federal Government, 29 Aug 60.

251. Secretary of the Air Force Order No. 115.1, subj: Organization and Functions of the Office of Missile and Satellite Systems, 31 Aug 60.

252. Secretary of the Air Force Order No. 116.1, subj: The Director of the SAMOS Project, 31 Aug 60.

253. Memorandum for the Chief of Staff from Dudley C. Sharp, Secretary of the Air Force, 31 Aug 60, w/1 Atch: List of assigned personnel.

254. Organization and Functions of the Office of Missile and Satellite Systems, ca 31 Aug 60.

255. Status Report (S/Gp3), subj: SAMOS (WS 117M), 31 Aug 60.

256. SO No. 649 AFBMD 2 Sep 60.

257. Ltr (C/Gp4), WDRSC to WDZJS, subj: Thor Boosters for SAMOS Program, 6 Sep 60.

258. Revised FY 1961 and FY 1962 Communication Cost Estimate Budget Projects 840 & 850 - SAMOS (S/Gp3), 12 Sep 60.

259. Memorandum for the Secretary of the Air Force (FOUO), subj: Reconnaissance Satellite Program, sgd James H. Douglas, Acting SOD, 15 Sep 60.

260. Ltr, SAFMS-1, sig BrigGen Robert E. Greer, subj: Establishment of SAMOS Project Office, 15 Sep 60.

261. GO No. 96 ARDC (FOUO), subj: Discontinuance of 4999th Data Processing Squadron, 21 Sep 60.

262. Director of SAMOS and Deputy Commander Space Programs Organization, 22 Sep 60.

263. GO No. 40 DAF, subj: Abolishment of the Office of the Assistant Chief of Staff, Buided Missiles, 23 Sep 60.

264. Ltr, AFBMD (WDG), sgd BrigGen Harvard W. Powell, to Deputy Commanders, Deputy Chiefs of Staff, Chiefs of Special Staff Offices, Chiefs of Offices through Directorate Level and Commanders of AFBMD Subordinate Organizations, subj: Correspondence Pertaining to the SAMOS Project, 26 Sep 60.

265. Ltr (S/Gp3), SAFMS-IDP to WDGE, subj: Items for Inclusion in AFBMD Chronology for Period 1 Jan - 30 Jun 60, 23 Sep 60, w/o Atch.

266. SAMOS Directives and/or Guidance (S/Gp3), ca Oct 1960.

267. SAMOS Program Progress Report Month Ending 30 Sep 60 (RCS: DD-DR&E (M) 397, 10 Oct 60.

268. AFBMD News Release, subj: SAMOS I Fact Sheet, ca 11 Oct 60.

269. Msg from AFBMD to ARDC, WDLP-17-10-7, 18 Oct 60.

270. Draft News Release, 18 Nov 60.

271. Draft News Release, 21 Nov 60.

272. Draft News Release, 21 Nov 60.

273. Mission Statement, 6594th Test Wing, 29 Dec 60.

274. Chronology of Sentry and SAMOS Program 2 March 1959 to December 1960, (S/Gp3), Jan 61.

275. Ltr, Aerospace Defense Systems Office (ADC), ADSO to WDL, subj: Using Command Participation, 24 Jan 61, w/o Atch.

276. AFBMD News Release 61-18, ca 31 Jan 61.

277. AFBMD News Release 60-82, subj: SAMOS II Fact Sheet, ca 31 Jan 61.

278. Msg (C/Gp3), fm AFCCS to ARDC, AFCCS 87626, 092319Z Feb 61.

279. SO No. G-15, ARDC, 16 Feb 61.

280. Ltr (C/Gp4), WDZJS, to LBZST, subj: Procurement of 4 Thor Boosters, 14 Mar 61.

281. Ltr, sgd BrigGen Harvard W. Powell, to Comdr Pac Msl Rg, Point Mugu, Calif, subj: PMR Support of SAMOS and MIDAS Programs, ; 7 Apr 61.

282. Memorandum for the Secretary of Defense, Attn: BrigGen George S. Brown, (S/Gp3), subj: SAMOS Launch Report, 11 Sep 61.